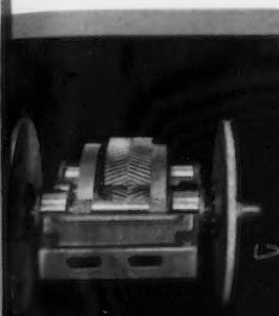


THE IRON AGE

DUCTION -:- MANAGEMENT

APRIL 5, 1934

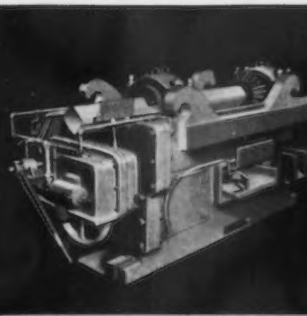
PROCESSES -:- NEWS



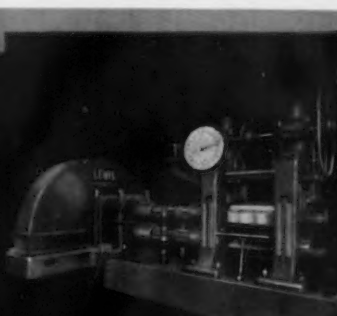
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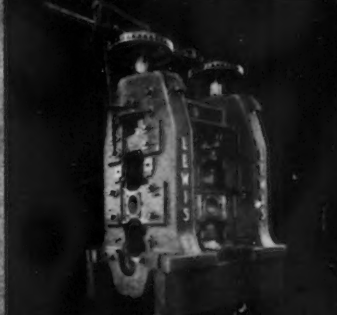
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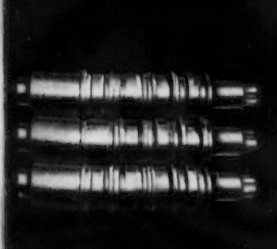
LEWIS 16" BREAKDOWN MILL with Pinion Stand and Gear Drive Integral—Motor-operated Screw-down—Water Cooled Rolls and Water Cooled Bearings for Aluminum, Brass and Non-Ferrous Metals.



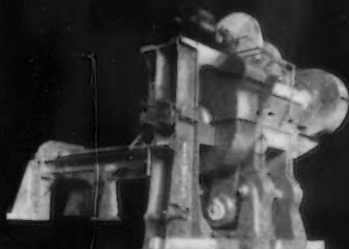
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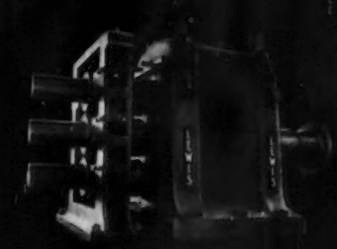
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APRIL 5, 1934

ESTABLISHED 1855

Vol. 133, No. 14

Statesmanship vs. Politics

▼ ▼ ▼

THE President rose to new heights of leadership in averting the automobile strike. A few days later Congress repudiated his leadership by overriding his veto of the independent offices appropriation bill. Confidence had hardly been restored by statesmanship before it suffered a new shock at the hands of politics.

Regardless of the merits of the appropriation bill, its enactment over the head of the chief executive is widely and properly interpreted as another legislative surrender to the power of a strongly organized minority. Divided responsibility means no responsibility, and the individual legislator, with an eye to the votes of a vocal and aggressive group, finds it easy to forget his duty to the nation as a whole.

NOT so with the head of the administrative branch. Upon his shoulders rests the heavy responsibility of lifting our entire social and economic system out of the morass of depression. Partiality to one part of the system at the expense of another would imperil success. Hence, when he faced a major crisis in the automobile industry he had no alternative but to mete out even-handed justice. Whatever his predilections or sympathies may have been, he was forced to take a course that would permit business to function. With the rare foresight of which he has shown himself capable in emergencies he recognized the hand of destiny and followed it.

The result was a new charter of industrial relations that promises to go down in history as inaugu-

rating a new era of good feeling between labor and management. Labor is given the right to organize. But there is no abridgment of the freedom of individual employees or minority groups of employees. All are guaranteed complete freedom to join or not to join any type of organization that suits their fancy. Coercion, intimidation and restraint are banned, whether emanating from employers or from unions.

IN sharp contrast with the manifest fairness of these principles are the one-sided provisions of the Wagner bill. Placing no responsibilities on organized labor, it hedges employers with rigid prohibitions. Granting unprecedented powers of investigation and decision to the National Labor Board, it invites grave abuses of authority. Ignoring the rights of individual employees, it legalizes the closed shop.

The Wagner bill is patently a political measure. It is a bid for the votes of a well organized minority group. Its defeat will not become certain until employers muster all their forces to achieve that end. Organization must be fought with organization. It is no time for temporizing and no time for inter-industry dissension. United action, and forceful action, must be taken, not to gain special favor or privilege, but to win a square deal. A statesman has spoken, but politicians must still be dealt with.

GILBERT L. LACHER
Managing Editor
The Iron Age

DIE cast aluminum ordinarily requires a minimum of machining to make it a finished product. However, extreme accuracy is so important to the Bell & Howell Co., Chicago, manufacturer of motion picture equipment and accessories, that not only are dies made with the utmost accuracy but the die castings have an unusual amount of machine work done on them to assure absolute interchangeability with the gage precision which is required in the best of motion picture apparatus.

An example of work of this kind is afforded by a projector gear case which is made of die cast aluminum. It is an open top box-like part which roughly measures over all 3 $\frac{3}{4}$ in. by 5 $\frac{1}{2}$ in. by 2 $\frac{1}{2}$ in. In passing through the shop this casting undergoes over 30 separate machining operations, seven inspections and almost a dozen other incidental operations, before going to the assembly department.

It houses the following parts: sprockets, sprocket guards, shuttle, shutter, hand knob, internal gear between motor pinion and shuttle cam, clutch lever, reel spindle gear drive, lens gate bearing, bearing for the reel arm support, speed control arm, adjustable aperture plate and the side film guide spring.

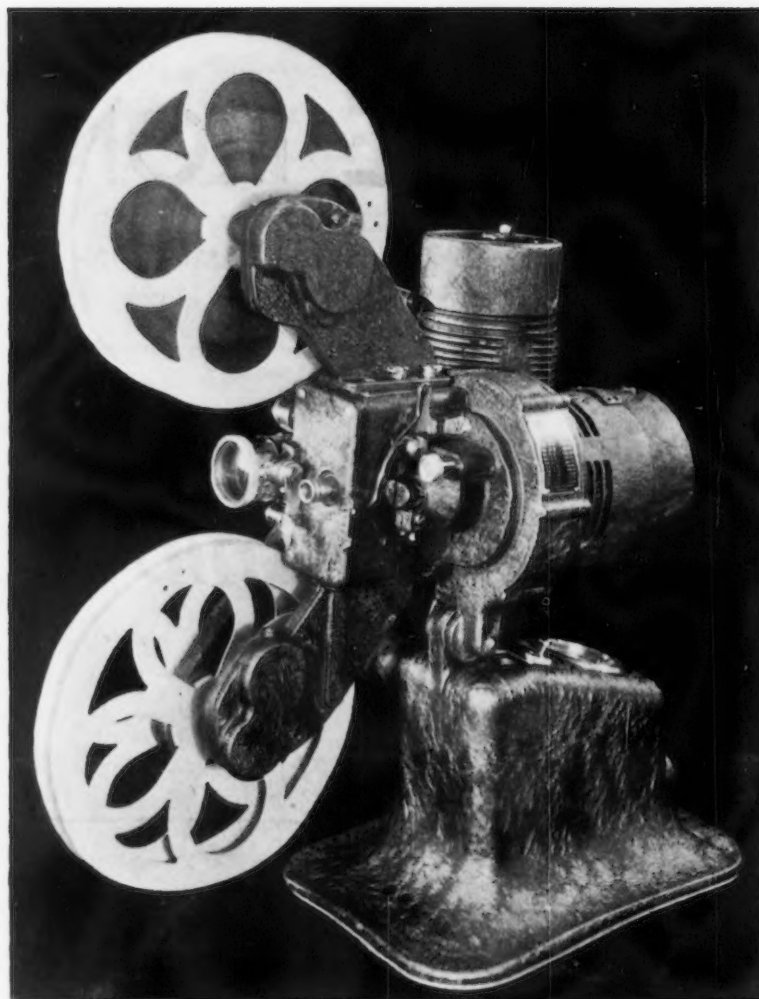
Castings are made by a jobbing shop and the quality of the castings lies with the foundry in meeting specifications, one of the principal points of which is that castings must be free of blow holes at critical points. Dimensions of the rough castings are specified to very close limits. For

instance, radii are marked 15/64 in. Hole centers are spaced to the limit of ± 0.001 in., and centers of holes as measured from the outer side of the casting that is later to be milled must be accurate to $+0.005$ in. Two holes are marked: 0.200 in. $+0.002$ in. countersink at 82 deg., and 0.089 in. ± 0.002 in. diameter, 1/32 in. deep.

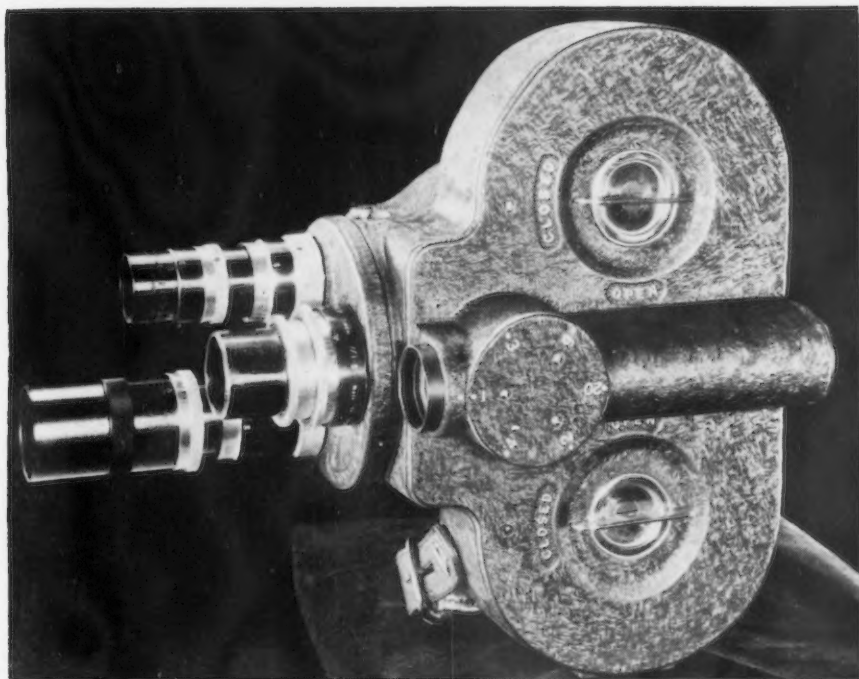
Composition of these castings is designated as No. 12 alloy, which consists of 92 per cent aluminum and 8 per cent copper. The weight of a

rough casting is 14 oz. After it has been machined it weighs 12.9 oz., 1.1 oz. of metal having been removed. The metal removed amounts to 8 per cent of the weight of the rough casting.

It is of interest to note that the Bell & Howell Co. makes extensive use of this metal for all housings, arms, stands, etc., for its cameras and projectors, thereby holding weights to the minimum consistent with durability, stability and practicability. For



Machining Die Cast Job in Making



By C. A. ZIEBARTH
Secretary and General Superintendent,
Bell & Howell Co., Chicago

Aluminum—a Precision Picture Projectors

instance a No. 70-DA camera containing 370 parts weighs only 5¼ lb. and a No. 57-J projector containing 849 parts weighs only 13½ lb.

At first it had been the designer's idea that the use of aluminum die castings made in dies of extreme accuracy would solve most of the machining problems. However, it was soon learned that shrinkage of the castings could not be controlled, that no matter how little this shrinkage might be it was sufficient to destroy

the accuracy demanded by Bell & Howell. The higher heat necessary to make aluminum-copper die castings aggravated the shrinkage problem, but other die cast metals were not suitable and so close machining was the only alternative.

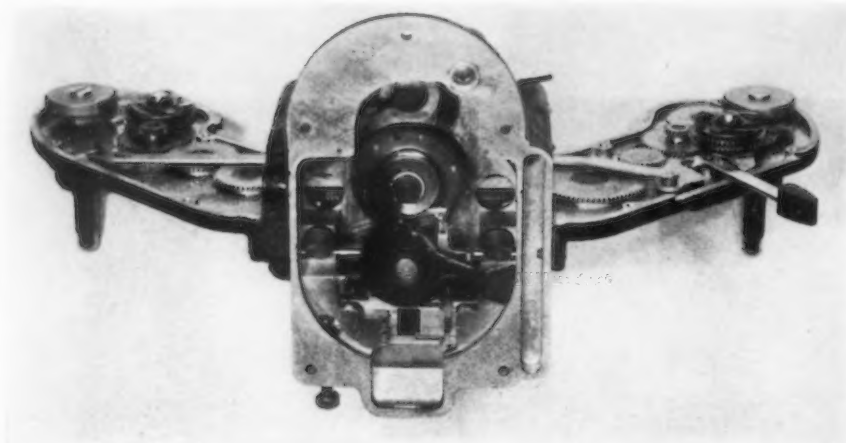
For extreme accuracy in a part of this kind several points must be kept in mind. First, the casting must be normalized by annealing so as to relieve all internal stress. Second, all fixtures and clamping devices must

be so designed that while the part is securely held it must not be strained and consequently warped so that required dimension limits cannot be held. Also relatively high cutter speeds with relatively light feeds and light pressures are necessary for extremely accurate results.

Operations start with the removal of fins and burrs, after which the castings are normalized. They are then finished, snagged and straightened, after which all castings are inspected. A filed surface is used for locating the part for the next operation, No. 5, which consists of end milling two surfaces that are parallel and are 0.0495 in. ± 0.001 in. apart. This profiling must be a first class job, because after another inspection these surfaces become the locating points for operation 7 which consists of milling the film guide stud slide-way and the aperture plate seat.

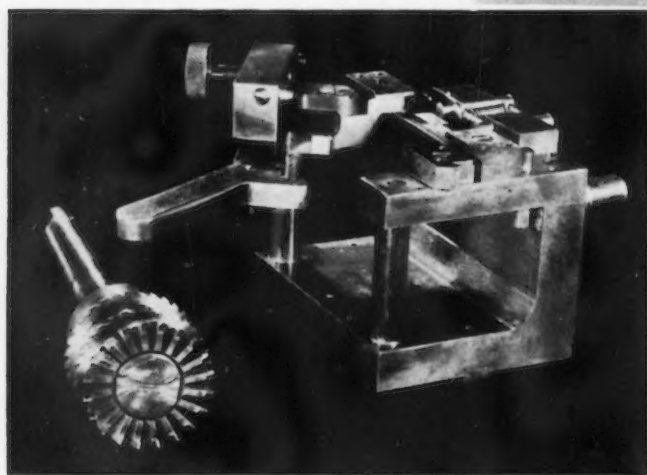
The part is dropped into a special fixture, which is then closed and the part tightened in place by a thumb screw, which presses against the casting. Opposite the thumb screw are spring lugs fastened to the fixture. Tension in these springs holds the casting firmly with its locating surface against the surface of the fixture. A light is used to verify the contact between these surfaces. Tolerance between parallel milled surfaces is $+0.001$ in. For operation No. 8, milling the film gate and lens carrier slide, the tolerance is $+0.0005$ in.

Operation No. 9 is instructive because of the type of fixture used. This is a job which calls for pro-



Two views of completed gear case. Cover removed, shown at right. Shuttle cut away to show shuttle pin and grooves, illustrated above.

filing the bottom of the casting. The fixture is rather massive considering the part it is to hold. The casting is worked in from the side, two holes in the casting slipping over two movable lugs that serve as clamps to hold the casting firmly against the locating surface. A lever is used to turn the lugs so that as they are screwed out by the hand wheel they



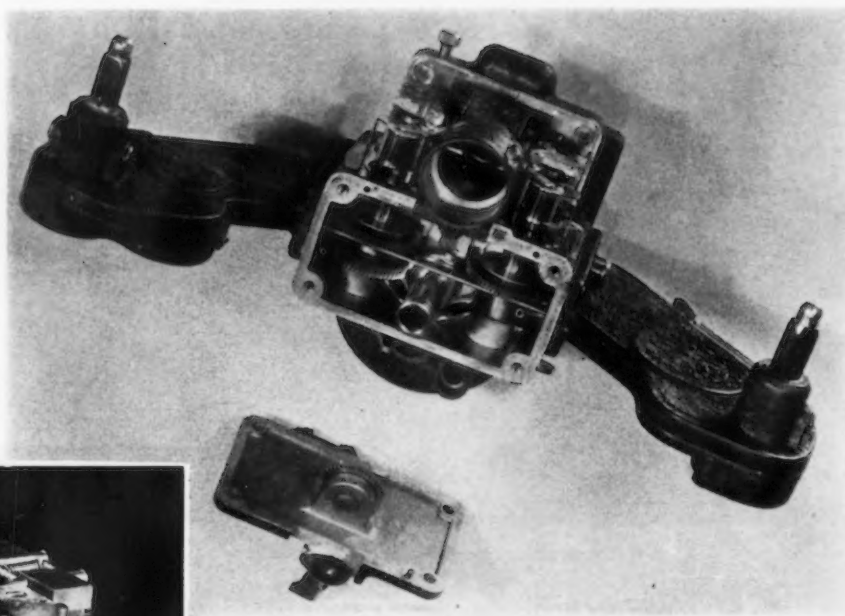
Spring lugs hold the casting firmly against locating points. (At left). This fixture and tool are used for operation 7. The fixture for operation 9. (Below). The hand wheel is designed with a friction clutch to avoid distortion of the casting.

will draw up against the casting. In this case the locating surfaces are those machined in operations 7 and 8. A spring pin supports the free end of the casting. This pin is locked in place before the profiling operation is started. Of special interest is the fact that the hand wheel on this fixture contains a clutch which slips before the point is reached when the casting would be warped because of excessive pull on the lugs.

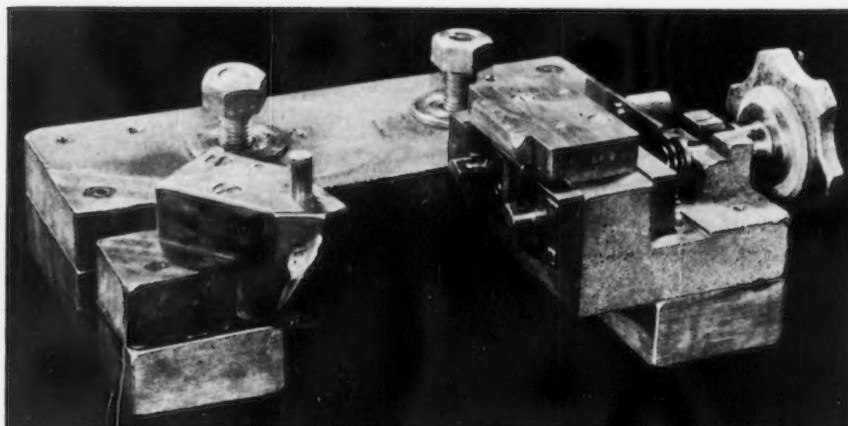
Another bench operation and then the part moves to operation 10, which consists of milling the shuttle pin grooves which from this point on become the main locating points along

with the surfaces milled in operations 7 and 8. These are two grooves, one on each side of the inside of the casting. Each groove measures 0.125 in. ± 0.0005 in. in width and 0.0905 in. ± 0.001 in. in depth. Tolerances for the location of each groove to the aperture plate and lens gate seats are ± 0.001 in. Alinement and fit are checked with Prussian blue and a full size gage pin.

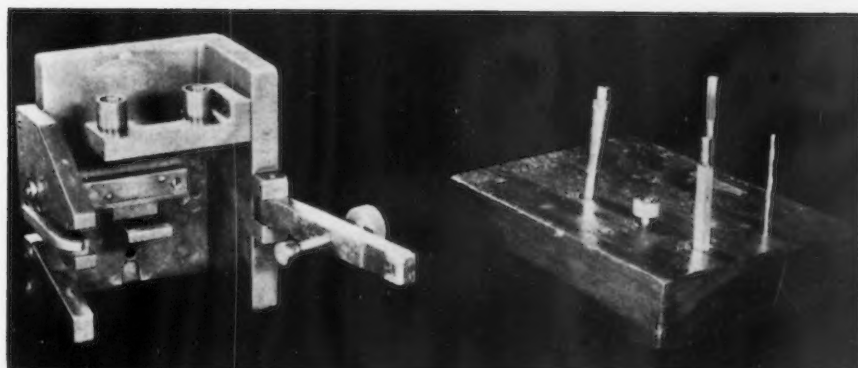
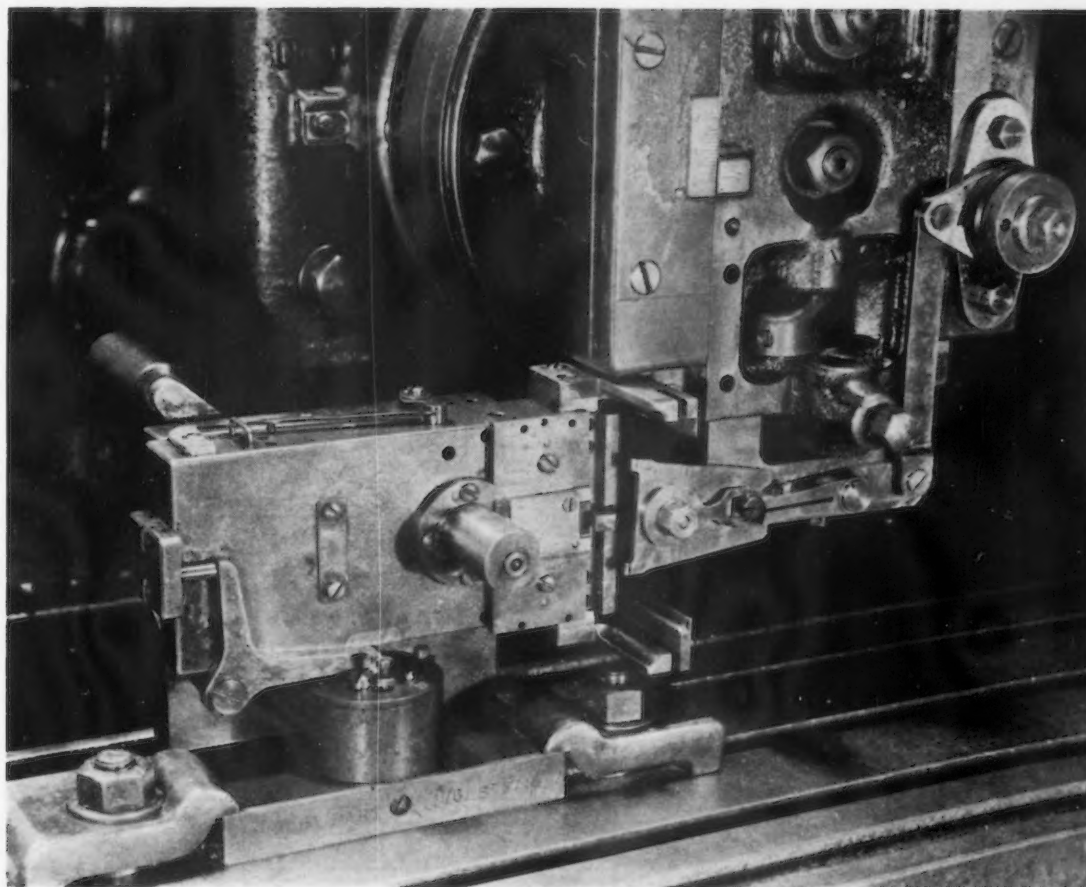
A milling machine is fitted with a Brown & Sharpe slotting attachment. A friction device mounted on this attachment operates a bell crank, which in turn operates an oscillating cut-



ter having two cutting edges. The cutter is pivoted on a stud. When the motion of the cutter is up, the upper cutting edge takes a cut in the upper groove and, because of the oscillating feature of the cutter, the lower cutting edge is clear of the casting. When the motion of the cutter is down, the lower cutting edge cuts in the lower groove and the upper cutting edge is free. By using



▲ ▲ ▲
 Fixture for operation 10. A dash pot slowly feeds the casting to the oscillating cutter. An indicator on top of the fixture shows when motion has stopped.

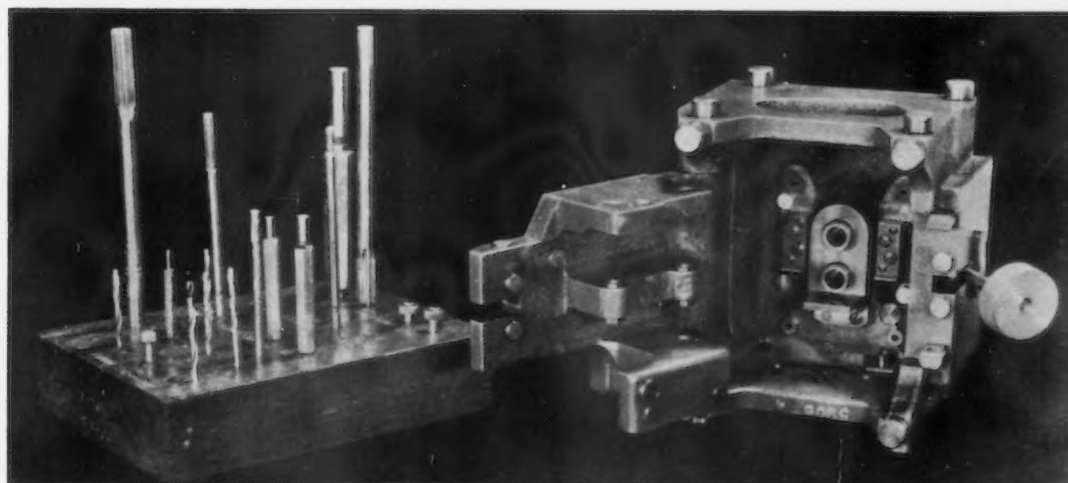


this method there is no difficulty about clearances of the cutting tool and cuts are easily made inside the casting and each cut terminates against the casting wall.

The special fixture for this operation makes use of the locating points established in operations 7 and 8. The casting is slipped in from the side and a hand lever is moved to clamp the casting and also to advance the fixture toward the cutter. Two-thirds of the total movement of this hand lever operates the casting locking device and the remaining one-third of its movement moves the fixture to

▼ ▼ ▼
 ▲ ▲ ▲
 In operation 12, two holes are spaced $2\frac{3}{16}$ in. apart on a registered dimension (above.)

▼ ▼ ▼
 ▲ ▲ ▲
 The two holes drilled and reamed in operation 13 are spaced from the shuttle pin grooves. No tolerance is permitted, (at right.)

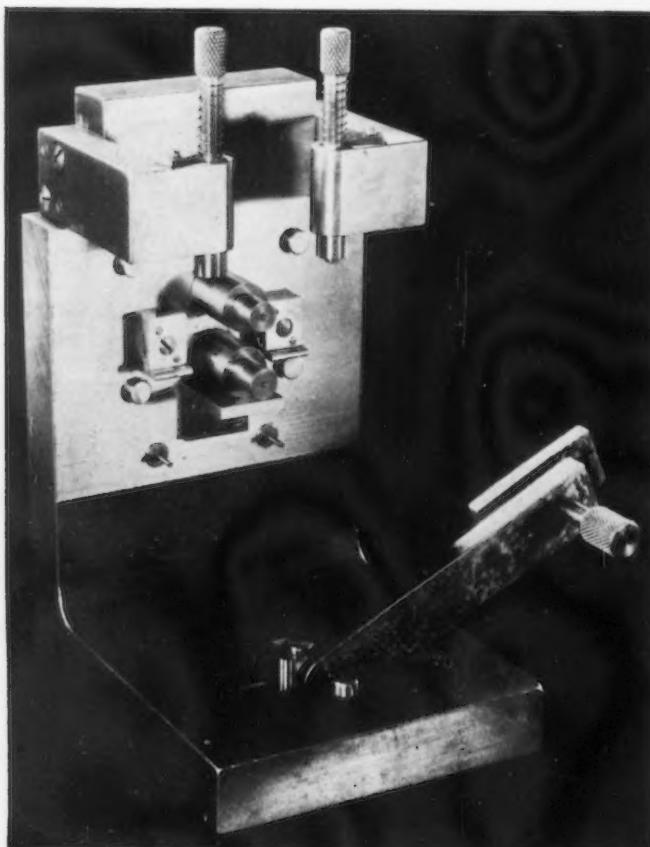


cutting position through a dash pot control which prevents feeding the part too fast. In fact, actual feeding takes place under the absolute control of the dash pot. A pointer on top of the fixture indicates when the forward motion has stopped, that is when the dash pot has completed its work and the feed to the proper depth is completed. From this point on the shuttle pin grooves become the major locating points.

Another bench operation and an inspection brings the part to operations 12 and 13, which call for drilling, reaming and counterboring two pairs of holes that are at right angles. These holes are worm gear and shuttle camshaft centers. For sound pictures the shuttle camshaft operates at 4320 r.p.m. Extreme accuracy is so essential that some dimensions are given to five places after the decimal, and no tolerances are permitted. The spacing of two holes is a registered dimension and accordingly no variation is permitted.

The fixture for operation 12 is simple but of extreme accuracy, the locating points now being the surfaces and locations established by operations 8 and 10. Two holes are drilled, reamed and counterbored. They are spaced 2 3/16 in. apart on a registered dimension. They are counterbored 13/32 in., 1/16 in. deep and then reamed to 0.219 in. -0.0005 in.

Form No. 114-B-3-21-33 STANDARD PROCESS RECORD Sheet #1					DESIGN No.	PART No.
NAME Gear Case					57	5760
ORDER OF OPER.	KIND OF OPERATION	IN. DEPT. NO.	SERIAL NUMBER OF TOOLS	INSTRUCTIONS	DATE	
				This space for full instructions, including descriptive use of tools, gage, fixtures and machine setup for same	10-6-33	
				Use part #897		
1.	Disc Grind			Remove heavy fins & burrs		
2.	Heat Treat			Normalize castings		
3.	Bench		4669	Finish snag & straighten		
4.	Bench		4669	Inspect		
5.	Drill		4956 N-4	End mill seat for Oil 121 & Oil 122 & (4) .250" c'bore		
6.	Bench		4956 N-4	Inspect		
7.	Mill		4340	Mill film guide stud slide way & aperture plate seat		
8.	Mill		N-11-13 4888	Mill film gate & lens carrier slide		
9.	Mill		3980 F-2 4351 4031	Profile bottom		
10.	Mill		3741 5444	Cut shuttle pin grooves		
11.	Bench		4888 N-6-7-8-9-11-13 4351 N-4 4031 N-2-3-4-5-6 5444 N-1-2-3 4340 N-7-8-9	Inspect		
12.	Drill		3967	Drill, ream & c'bore (2) 13/32" holes		
13.	Drill		5906	Drill & ream (2) .148" (2) .453" (2) .128", 1/8 dia. & (2) .219", (1) 3/8" & (1) .1878" hole		
14.	Drill		8031	Drill & ream .155" & .172" holes. Tap 5/16" -32 & #4-40. Drill & tap #2-56 hole		
15.	Drill		3769	Drill & tap (4) #4-36 (6) #2-56 & .343 holes		
16.	Bench		3967 N-4 5906 N-15-16-17-18-20	Inspect		
17.	Mill		5072	Mill air port clearance		
18.	Mill		3738	Mill slot for clutch lever		
19.	Mill		9045 F-1 5445	Mill vertical roller slots & key slot		
OK TO USE WITH DRAWING C. O. NO. 15612						
C. O. NO. 15612						



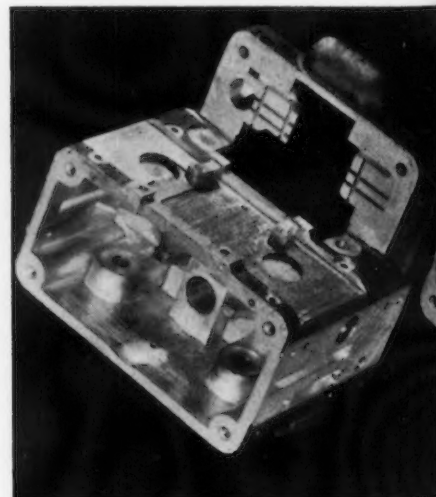
The sequence of operations on the projector gear case is shown in the process record sheets reproduced above.

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The pair of holes at right angles to the above are drilled and reamed during operation 13. Locating points are the same as for operation 12. The fixture is massive and of extreme accuracy. The dimension from the center of the aperture to the farthest hole is 1.9456 in. and the holes are spaced center to center 0.9739 in. +0.0005 in. These holes are reamed to 0.453 in. -0.0005 in.

▲ ▲ ▲

This registering gage is used to check work performed by operations 12 and 13, (at left.)



STANDARD PROCESS RECORD				Sheet #2	DESIGN No.	PART No.
NAME					57	5760
ORDER OF OPER.	KIND OF OPERATION	IN. DEPT. NO.	SERIAL NUMBER OF TOOLS	INSTRUCTIONS		DATE
				This space for full instructions, including descriptive use of tools, figs, fixtures and machine setup for same		
20.	Mill		4475	Mill horizontal roller slots		10-6-33
21.	Mill		5182 X-1	Face bore for 1177		
22.	Mill		5035			
23.	Mill		5182 X-1	Mill clearance for gears		
24.	Mill		5073			
25.	Mill		8173	Mill seat for 4255		
26.	Mill		9045	Mill tap & bottom surfaces to .844 dim.		
27.	Mill		9045	Mill front surface to 2.547" dim.		
28.	Mill		9045 F-1 X-8	Mill 3/32" X 1.089 opening		
29.	Mill		5035 F-1 X-12	Mill (2) 3/16" x 1-3/4" dia. slots		
30.	Mill		5035 F-1 X-12	Mill 7/32" x 1-1/8" dia. slot		
31.	Mill		4351	Profile shutter clearance		
32.	Bench			Remove burrs		
33.	Bench		5445 N-4-5-6	10-11-12		
34.	Bench		4475 N-5-7-8	Inspect		
35.	Bench		5035 N-14			
36.	Bench		8173 N-4-5			
37.	Bench		3738 N-4-5			
38.	Drill		9322	Profile clearance & slot for oil baffle		
39.	Drill		9046	Drill & ream all holes on top & bottom surface of case.		
40.	Drill			Drill & ream (2) dowel holes on front surface		
41.	Drill		7167	Drill #42, drill & tap #10-32, c'bore .281" x 1/16", ream 1/4" cored hole. Drill #30 hole.		
42.	Drill		4725	C'Drill & tap (8) #5-40 & (4) #8-32 holes & drill 1/4" air hole		
43.	Drill		5042	C'bore 1.393" dia. for gear studs		
44.	Bench		4047	Remove burrs		
45.	Clean			Clean in gas		
ON TO USE WITH CHAMFERING C. & NO.				15412		
C. & NO.				15412		

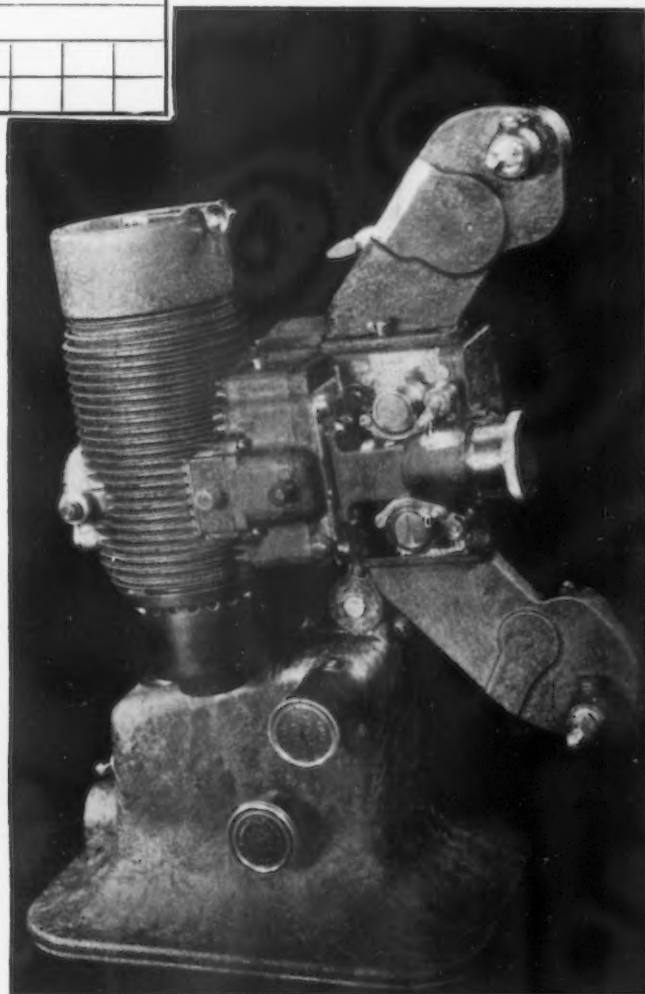
held up by springs must, when pressed down, feel their way into the other pair of holes which were finished in operation 12. These plug gages are made to minimum hole diameters and are spaced to a registered dimension.

Illustrations of the care used in finishing this casting are afforded by operation 22 when clearances for gears are milled, and by operation 29 when the shutter clearance is milled. Few die castings would be touched by machine operations at such points as the above.

To sum up there are a total of 43 operations specified on this 14-oz. die casting from which is removed a total of 1.1 oz. Seven of these are bench inspections. Over 50 special gages serve both the bench inspectors, operators and floor inspectors. More than 30 special fixtures for machine operations are in use and 60 spindles must be set up and checked for drilling, reaming and counterboring operations. All this to maintain the high degree of accuracy necessary for the interchangeability and durability of gears, camshafts, sprockets, shuttle, aperture opening and lens gate, which when assembled, must show 1440 pictures per minute with theater quality.

The registering gage used to check the diameters and the spacing of these holes is an exceptionally fine example of workmanship. Plugs for checking the holes finished in operation 13 are fixed to the back of the gage. The locating points are the shuttle pin grooves. The casting is slipped into the gage to the locating points. As this is done the two fixed plugs must slip in the holes. The casting is then lightly clamped in place and two plugs

Not alone the gear case, but all castings used on this projector are die cast aluminum alloy. (At right). This includes base, lamp and motor housing, blower housing, gear housing extension arms, lens gate and condenser holder.



A rough and a finished projector gear case. (Two illustrations at left). Forty-three operations are required to complete this casting.

STAINLESS steel has found one of its most important fields of usefulness in the dairy equipment industry and its use in the manufacture of dairy machinery has contributed to the health of the nation by the preservation of milk products against contamination and spoilage as well as against discoloring and affecting the taste of the product during handling caused by dairy products coming in contact with equipment built of material not so well suited for this purpose.

Being produced in flat rolled, tubular and other forms and having physical qualities that permit its fabrication, stainless steel may be used for all parts of dairy equipment for which its use is regarded as preferable to other metals. With its resistance to corrosion and to attacks by cleansing mediums, not being subject to discoloration and being free from the objections found in some other metals when used in milk processing equipment the stainless material is now generally recognized as the best metal for all parts of dairy machinery that come in contact with the milk. The 18-8 chrome nickel grade of stainless steel is commonly used in the manufacture of dairy equipment, being regarded as the most suitable for that purpose.

Past the Development Stage

The manufacture of dairy equipment of stainless steel has passed through a development stage which has tended to make the equipment more efficient and more sanitary and present research and experimental work indicate the probability of further improvement in the construction of this equipment, including in some cases the replacement of plated cast parts with stainless steel stampings. This substitution has recently been made in some parts resulting in

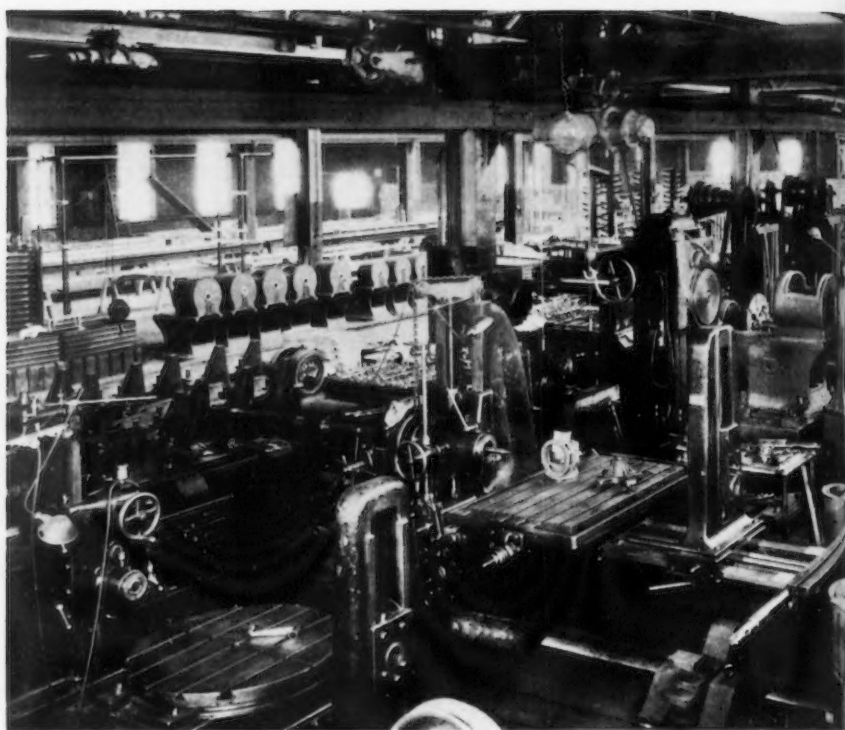
improvement in the appearance of the equipment and in saving in weight of the parts. One example of the substitution of stainless steel for a part that is made of a brass casting is found in a piece of equipment about 27 in. square, which in brass weighs about 65 lb. after finishing and which has recently been made, but so far only in an experimental way of two welded stampings of 18-gage stainless steel weighing only 16 lb.

Much development work in fabricating stainless steel for dairy appliances has been done by the York Ice Machinery Co., York, Pa., one of the leading manufacturers in that field. This company devotes its Canton, Ohio, plant exclusively to making equipment for the dairy industry. The manufacturing includes all the production work except the forming of stampings, although a few of these in the smaller sizes are made in the plant. As the plant is not equipped for doing any of the larger stamping work the stampings are secured from other plants that have devoted con-

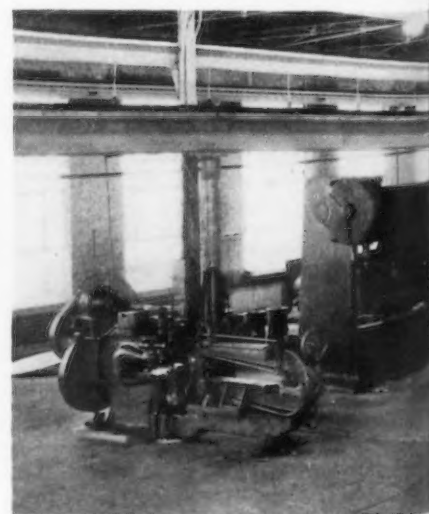
siderable attention to drawing and forming stainless steel.

A Range of Products

Dairy equipment produced in the York plant in Canton includes milk



Dairy Equipment



The machine side of the tank shop shows



York Ice Machinery Corpn.

A PORTION of the machine shop, showing ice cream freezer bases and cylinders in process of fabrication.

By F. L. PRENTISS
Cleveland Editor, THE IRON AGE

of Stainless Steel

pasteurizers in capacities of 100 to 500 gal., vertical and horizontal holding and storage tanks for milk and for ice cream mix in capacities of from 200 to 6000 gal., internal tube and surface type coolers, heat ex-

changers, ice cream freezers in capacities of from 40 to 120 qt., and milk truck tanks. A very recent development in the plant is the bringing out of a continuous ice cream freezer in which the ingredients are fed in



York Ice Machinery Corpn.

partially fabricated stainless steel cylinders for vertical milk holding tanks and pasteurizers

THE dairy industry has provided one of the most fertile fields for the use of stainless steel. Resistance to corrosion, ease of cleaning and freedom from affecting the taste of the product all have contributed to its use. In this article an interesting account is given of the manufacture of dairy equipment from stainless steel and the utilization of welding for that purpose.

at one end of the machine and the ice cream is discharged at the opposite end.

Specializing in stainless steel equipment for the dairy, the York company uses the stainless material almost exclusively for any part where the milk or the ice cream mix contact the metal, unless the cost of the stainless steel does not warrant its use. It is also largely used for parts for trimming. Many buyers want milk tanks with stainless steel outside casing, because of its attractive and sanitary appearance.

Stainless steel of the 18-8 chromium nickel type is used exclusively in the York plant for making dairy equipment. Two grades are used, a pickle finish and a No. 4 polish finish. Where fabrication is required such as cutting openings, pickle finish sheets are used and the part is polished after fabrication. Where no operation that mars the surface of the steel is required, the polish finish sheet is used and no subsequent polishing is required except at welds. Tank cylinders, the only operation on which the longitudinal seam is on the side, are made of the polished sheet. The only surface finishing required in this case is the grinding and polishing of the



▲ ▲ ▲
View in the buffing department. The shop boxes contain heat exchange plates and ice cream freezer parts.
▼ ▼ ▼

York Ice Machinery Corp.

material at the weld. The company recommends and uses 14-gage sheets except in cases where pressures and stresses necessitate material of a heavier gage.

Welding Used Exclusively

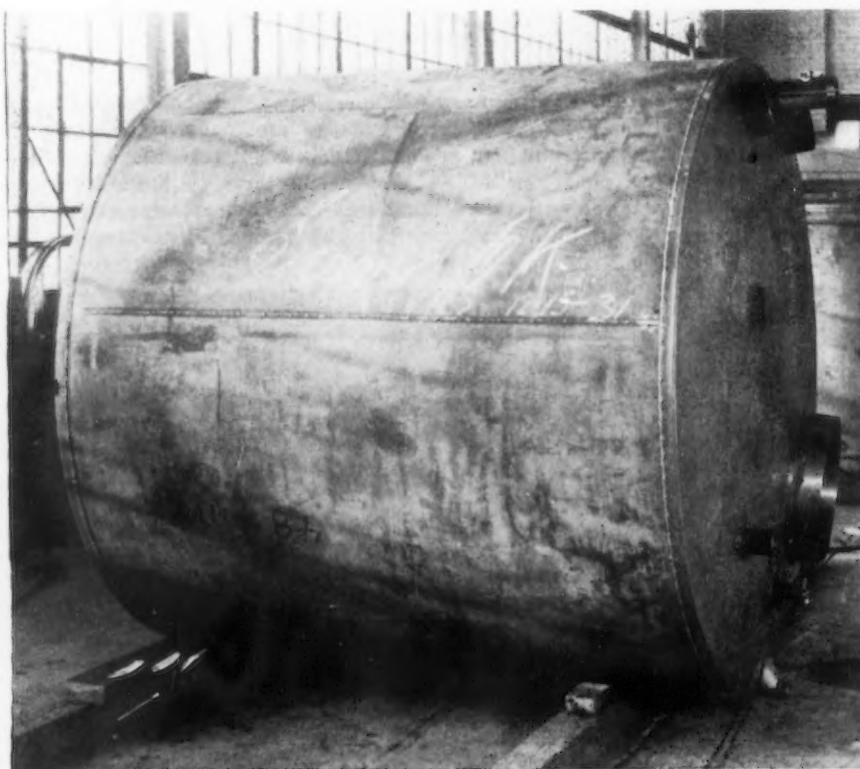
All joints are made by welding and the arc welding process is used exclusively. Welding is done on a battery of welders supplied by the Westinghouse Electric & Mfg. Co. The company has found that the development of efficient welders of stainless steel requires long training in welding this steel and that a good welder of plain carbon steel cannot qualify as a welder of the stainless material until he has had long practical experience in welding the stainless steel.

One of the most difficult problems in the manufacture of dairy equipment of stainless steel has been the avoidance of pits in the surfaces of the weld. This equipment after installation in dairies is subjected to very rigid inspection by most municipal health officials and they refuse to approve equipment that is not free from pits and cracks in which bacteria may collect and grow. This inspection serves as a check on the makers of the equipment who with proper welding and polishing practices and plant inspection aim to produce equipment that will pass the close scrutiny of city and State inspectors.

Up to four years ago the York plant eliminated pits by filling them with solder. Now with improved welding practices the weld after the

bead is ground down, is said to be as free of pits as the parent metal. In the welding practice fusion is effected entirely through the metal when possible in order to assure a solid weld and to provide sufficient bead that can be ground and polished on the under side of the sheet so that pits are eliminated. The arc welding method concentrates the heat to a

small area adjacent to the weld and especially designed copper welding rings are provided for carrying the heat away as quickly as possible. The welds are ground with abrasives, starting with coarse and ending with finer grinding wheels, the finer grinding being done with abrasives up to 180 grits or higher, which bring the surface to a condition that permits it



Stainless steel cylinder for 2000-gal. milk holding tank with fittings on the front dished head.

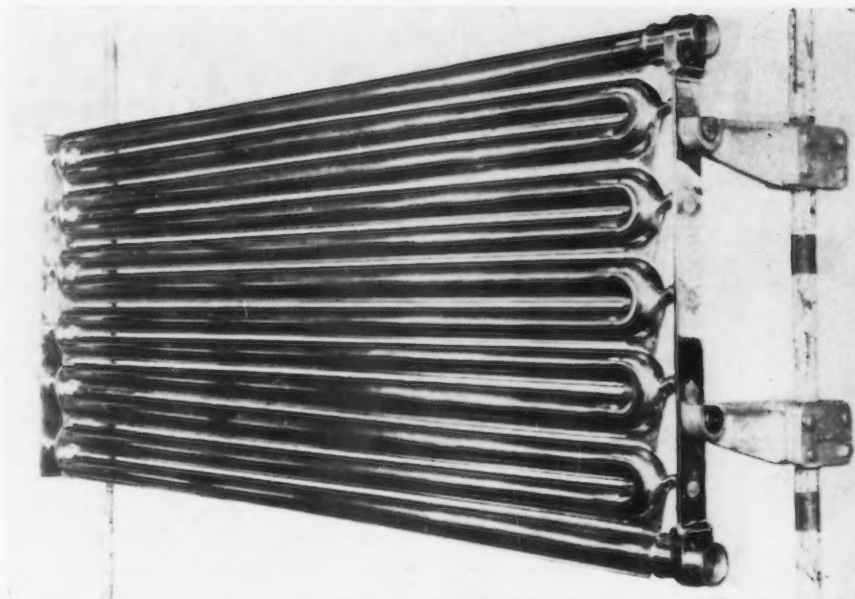
York Ice Machinery Corp.

to be polished and buffed. This is done with rag wheels and chrome oxide.

Water Jacketed Tanks

The milk tank cylinder of pasteurizers is of stainless steel and the outside of this is a water jacket of plain carbon steel, unless the stainless material is specified. The stainless sheet is rolled into its cylindrical form, then welded longitudinally and the weld is ground. In some cases where extreme accuracy in diameter is required the cylinder is rerolled after grinding. The stationary and hinged covers of fabricated or stainless steel are then welded to the cylinder. Cork board insulation is placed between the water jacket and the outside casing, the latter usually being of plain carbon steel. The casing, provided plain steel is used, is sandblasted with steel grit to remove the scale and provide a rough surface to which a non-corrosive coating will adhere. Then zinc or other non-corrosive metal is sprayed on, the Shoop Metalloy process being used for applying this protective coating. Then a coating of paint is applied over the surface.

When stainless steel is used for the outer casing a 12-gage plain carbon steel sheet backing is provided to assure strength and this is given a protective coating with aluminum flake and spar varnish. Then the stainless steel casing is wrapped around the cylinder and welded.



York Ice Machinery Corp.

This milk cooler is made entirely of stainless steel. All joints are arc welded and splash strips are an integral part of the stainless steel tubing.

Milk holding tanks have stainless steel cylinders, and other parts that are fabricated of the stainless material, include agitator, thermometer and observation and light fittings, inlet and air vent connections and man hole door frames, these parts being welded into the dished head of the tank. These tanks are made in three types. After the cylinder is fabricated and the fittings applied, succeeding operations depend upon the type. If it is a plain insulated tank, cork board insulation is laid on the

stainless steel cylinder and fastened with a cork binder. This is encased in a 3/16 in. common steel shell and dished heads are fitted and welded to the casing and supporting feet are assembled and welded to the casing.

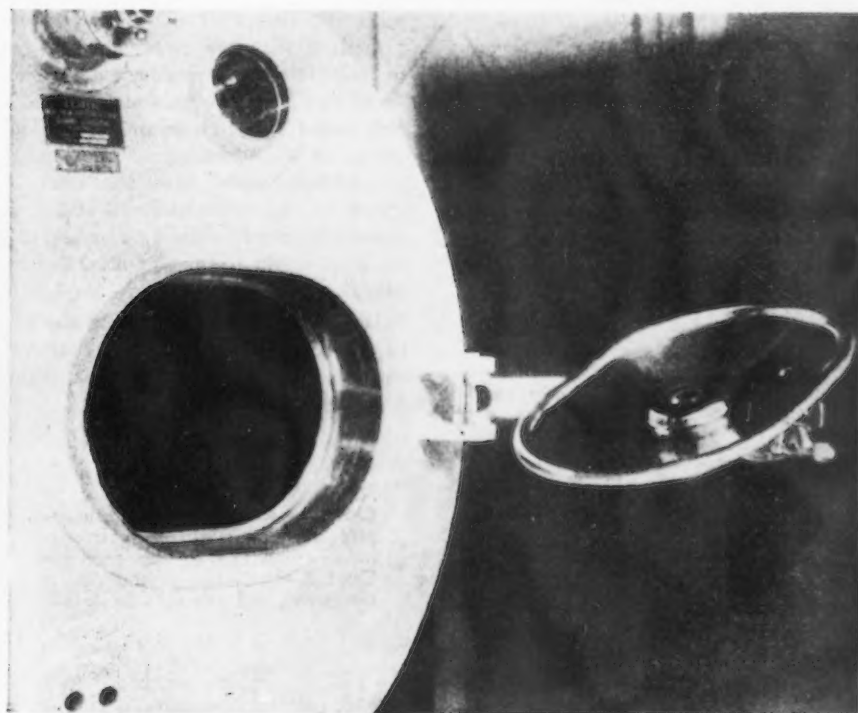
If the tanks are to be ammonia cooled, they are pressure tested and ammonia coils and headers are tightly wrapped around the milk cylinder and the coils are covered with galvanized iron sheet steel. Cork board insulation is then applied and the remaining operations are similar to those followed in making the plain insulated tanks. The third type of tank is brine cooled. In manufacturing these a brine jacket of plain carbon steel is fabricated around the milk cylinder with necessary supports between the cylinder and the jacket and the jacket is covered with insulation. The remaining operations are similar to those used in finishing the other two types of tanks.

Construction of truck tanks is practically the same as the plain insulated holding tanks except that they do not have all the fittings required for the latter and the truck tanks have an aluminum outside casing.

All-Welded Surface Cooler

An interesting example of fabrication and welding stainless steel is found in the all-welded constructed surface cooler for milk which is shown in one of the photographs. This cooler consists of a series of stainless steel tubes and return bends. Welded to the tubes and integral parts thereof, are splash strips that guide the milk and prevent it flying off the

(Concluded on Page 82)

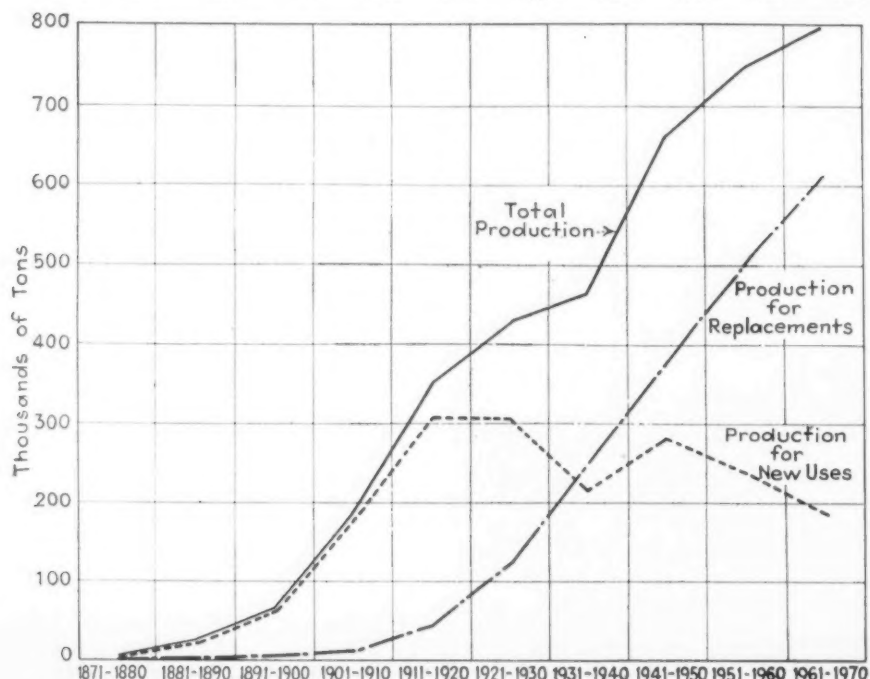
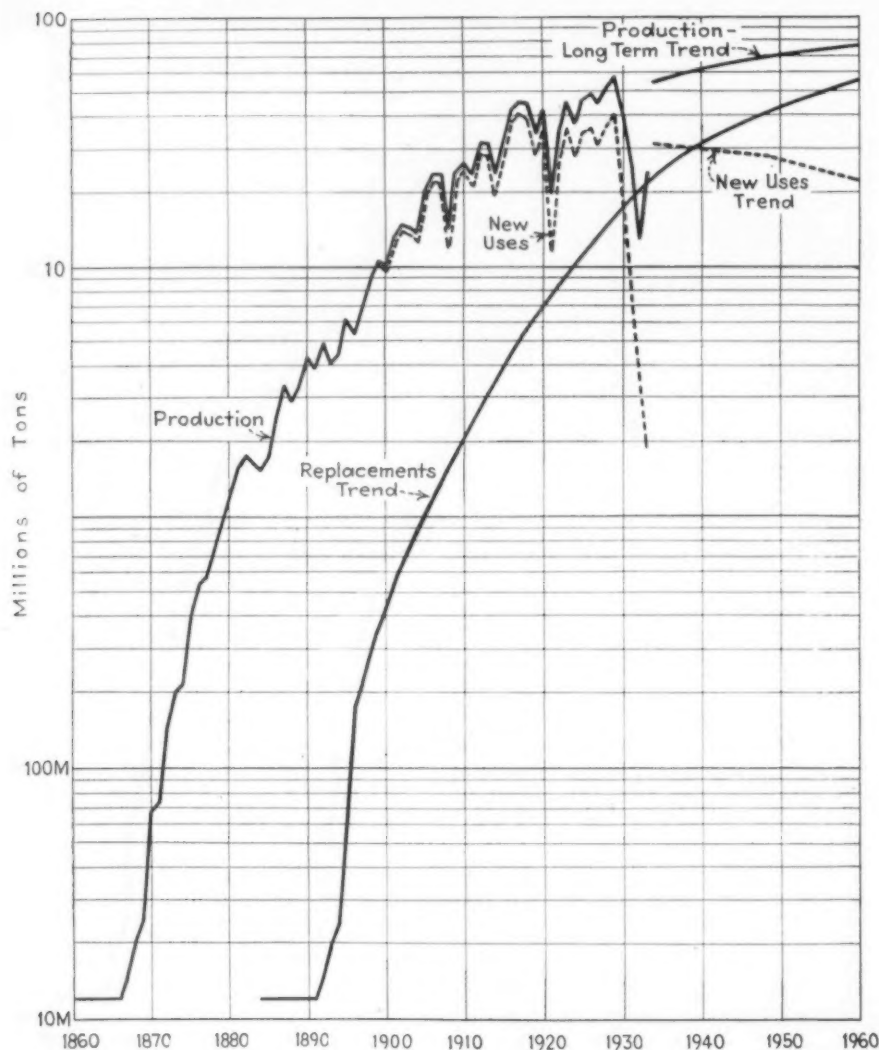


York Ice Machinery Corp.

Manhole door of this horizontal holding tank is made of a single stainless steel stamping and the door frame is fabricated from stainless steel sheet and plate material.

Estimated Production of Steel for

By DAVID M. POLAK



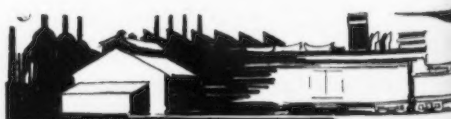
AN earlier article (THE IRON AGE, March 8) pointed to a conclusion that steel production of the future will increase at a less rapid rate as time goes on, and eventually will stabilize.

A contributing factor in this expected outcome is the decline in new uses of steel, concurrent with the slowing down in the physical development of the country. This is especially true of railroad building, and to a lesser extent other types of construction. As time elapses, replacements of steel become necessary, although of course some steel, being protected, is never replaced. Rails, subject to wear, can either be replaced by new steel or rerolled.

A slowing down in the rate of increase of production per capita has already been noted, and this, coupled with the fact that population is expected to increase more slowly (and perhaps turn downward some 20 years from now), points unmistakably to a less rapid rise in demand in the future. It therefore seems reasonable, in taking a look into the next 35 years, to expect to find a decrease in the use of steel for new purposes, and an increase in the use of steel for replacements.

In the accompanying table the life of steel has been very conservatively estimated at 25 years, although doubt-

Chart 1—Above at left: Estimated production of steel for replacement and new uses, 1860 to 1956, gross tons. Chart 2—Production of steel for replacements and new uses by decades.



Replacements and New Uses

lessly a great part of the steel used may never need to be replaced. Actual production has been used between 1859 and 1932, and in the subsequent years the calculated long-term trend as determined in the preceding article* has been accepted as the measure of production.

A lag of 25 years has therefore been allowed. The theory advanced is that at the end of 25 years the steel laid down in the first year will have to be replaced. Therefore, from the production of the 26th year the production of the first year must be deducted to account for replacements in the 26th year. Everything left over in the 26th year is steel produced for new uses.

The method is illustrated below:

	Tons	
Production, Year 1884	1,551,000	Total
Less Production, Year 1859	12,000	Replacements
Balance, Year 1884..	1,339,000	New uses

Table I shows production of steel ingots and castings between 1859 and 1932. Replacements are given between 1884 and 1932 on the basis of a 25-year life estimate. Future years are shown on the basis of calculated trends as arrived at in the preceding article.

In Table I actual production is used between 1859 and 1933. The long-term steel trend (as calculated for preceding article) is substituted thereafter.

Replacements between 1884 and 1895 are based on actual production, and thereafter are based on the long-term steel trend, including a 25-year lag.

New uses 1859 to 1883 are actual production; thereafter it is the differ-

*Page 17, March 8.

Chart 3—Percentage of steel production for new uses and for replacement purposes. This is given for decades, 1891 to 1970, and is based on assuming steel in use a life of 25 years.

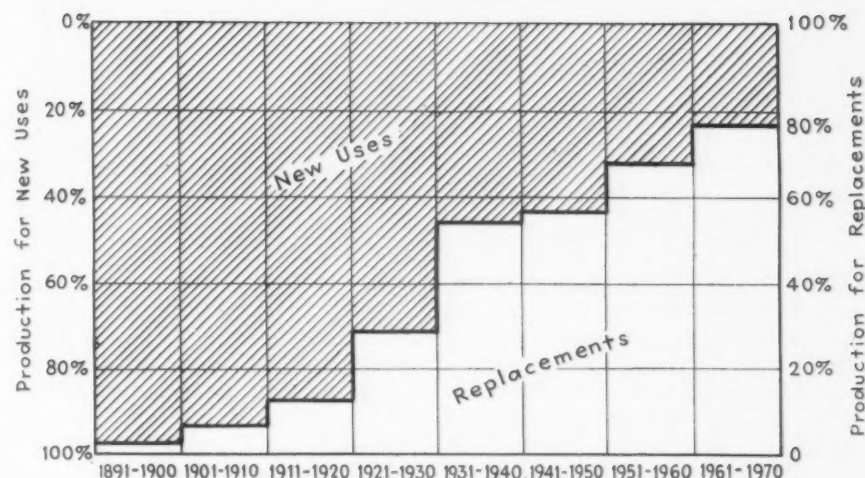


TABLE I—ESTIMATED PRODUCTION OF STEEL FOR REPLACEMENT AND NEW USES 1859-1970

Year	Pro- duction	Replacements Trend Estimated	New Uses	Year	Pro- duction	Replacements Trend Estimated	New Uses
1859	12,000	.....	12,000	1914	23,513,000	3,560,000	19,953,000
1860	12,000	.....	12,000	1915	32,151,000	3,960,000	28,191,000
1861	12,000	.....	12,000	1916	42,774,000	4,540,000	38,234,000
1862	12,000	.....	12,000	1917	45,061,000	5,040,000	40,021,000
1863	12,000	.....	12,000	1918	44,462,000	5,650,000	38,812,000
1864	12,000	.....	12,000	1919	34,671,000	6,310,000	28,361,000
1865	12,000	.....	12,000	1920	42,133,000	7,010,000	35,123,000
1866	12,000	.....	12,000	1921	19,784,000	7,820,000	11,964,000
1867	15,000	.....	15,000	1922	35,603,000	8,640,000	26,963,000
1868	20,000	.....	20,000	1923	44,944,000	9,550,000	35,394,000
1869	24,000	.....	24,000	1924	37,932,000	10,480,000	27,452,000
1870	67,000	.....	67,000	1925	45,394,000	11,430,000	33,964,000
1871	73,000	.....	73,000	1926	48,294,000	12,490,000	35,804,000
1872	143,000	.....	143,000	1927	44,935,000	13,680,000	31,255,000
1873	199,000	.....	199,000	1928	51,544,000	14,900,000	36,644,000
1874	216,000	.....	216,000	1929	58,433,000	16,160,000	40,273,000
1875	390,000	.....	390,000	1930	40,699,000	17,450,000	23,249,000
1876	533,000	.....	533,000	1931	25,946,000	18,770,000	7,176,000
1877	569,000	.....	569,000	1932	13,681,000	20,160,000	6,479,000
1878	732,000	.....	732,000	1933	23,450,000	21,560,000	1,890,000
1879	935,000	.....	935,000	1934	54,300,000	23,010,000	31,290,000
1880	1,247,000	.....	1,247,000	1935	55,500,000	24,500,000	31,000,000
1881	1,588,000	.....	1,588,000	1936	56,600,000	25,940,000	30,660,000
1882	1,737,000	.....	1,737,000	1937	57,700,000	27,300,000	30,400,000
1883	1,674,000	.....	1,674,000	1938	58,800,000	28,690,000	30,110,000
1884	1,551,000	12,000	1,539,000	1939	59,800,000	29,980,000	29,820,000
1885	1,712,000	12,000	1,700,000	1940	60,800,000	31,280,000	29,520,000
1886	2,563,000	12,000	2,551,000	1941	61,800,000	32,580,000	29,220,000
1887	3,339,000	12,000	3,327,000	1942	62,800,000	33,700,000	29,100,000
1888	2,899,000	12,000	2,887,000	1943	63,700,000	35,000,000	28,700,000
1889	3,386,000	12,000	3,374,000	1944	64,700,000	36,050,000	28,650,000
1890	4,277,000	12,000	4,265,000	1945	65,700,000	37,100,000	28,600,000
1891	3,904,000	12,000	3,892,000	1946	66,700,000	38,300,000	28,400,000
1892	4,928,000	15,000	4,913,000	1947	67,600,000	39,600,000	28,000,000
1893	4,020,000	20,000	4,000,000	1948	68,400,000	40,800,000	27,600,000
1894	4,412,000	24,000	4,388,000	1949	69,200,000	42,100,000	27,100,000
1895	5,115,000	67,000	5,048,000	1950	70,000,000	43,400,000	26,600,000
1896	5,282,000	178,000	5,104,000	1951	70,800,000	44,700,000	26,100,000
1897	7,157,000	220,000	6,937,000	1952	71,600,000	46,000,000	25,600,000
1898	8,933,000	301,000	8,632,000	1953	72,300,000	47,300,000	25,000,000
1899	10,640,000	367,000	10,273,000	1954	73,000,000	48,600,000	24,400,000
1900	10,188,000	429,000	9,759,000	1955	73,800,000	49,800,000	24,000,000
1901	13,474,000	570,000	12,904,000	1956	74,600,000	50,900,000	23,700,000
1902	14,947,000	648,000	14,299,000	1957	75,300,000	52,100,000	23,200,000
1903	14,535,000	748,000	13,787,000	1958	75,900,000	53,200,000	22,700,000
1904	13,860,000	877,000	12,983,000	1959	76,400,000	54,300,000	22,100,000
1905	20,024,000	1,053,000	18,971,000	1960	77,000,000	55,500,000	21,500,000
1906	23,398,000	1,196,000	22,202,000	1961	77,600,000	56,600,000	21,000,000
1907	23,363,000	1,414,000	21,949,000	1962	78,100,000	57,700,000	20,400,000
1908	14,023,000	1,594,000	12,429,000	1963	78,600,000	58,800,000	19,800,000
1909	23,955,000	1,806,000	22,149,000	1964	79,100,000	59,800,000	19,300,000
1910	26,095,000	2,055,000	24,040,000	1965	79,600,000	60,800,000	18,800,000
1911	23,676,000	2,350,000	21,326,000	1966	80,100,000	61,800,000	18,300,000
1912	31,251,000	2,700,000	28,551,000	1967	80,500,000	62,800,000	17,700,000
1913	31,301,000	3,110,000	28,191,000	1968	80,900,000	63,700,000	17,200,000
				1969	81,200,000	64,700,000	16,500,000
				1970	81,400,000	65,700,000	15,700,000

TABLE II—DIVISION OF PRODUCTION OF STEEL INGOTS AND CASTINGS INTO PRODUCTION FOR REPLACEMENTS AND PRODUCTION FOR NEW USES
(In Thousands of Gross Tons)

Decade or Year	Total Production	Production Estimated for		Per Cent of Production	
		Replacements	New Uses	Replacements	New Uses
2 Years—1859-1861....	24	...	24	...	100.0
1861-1870	198	...	198	...	100.0
1871-1880	5,037	...	5,037	...	100.0
1881-1890	24,726	84*	24,642	0.3	99.7
1891-1900	65,579	1,633	63,946	2.5	97.5
1901-1910	187,674	11,961	175,713	6.4	93.6
1911-1920	350,993	44,230	306,763	12.6	87.4
1921-1930	425,562	122,600	302,962	28.8	71.2
3 Years—1931-1933....	63,077	60,490	2,587	95.9	4.1
Total Past 75 Years....	1,122,870	240,998	881,872	21.5	79.5
1934-1940	403,500	190,700	212,800	47.3	52.7
1941-1950	660,600	378,630	281,970	57.3	42.7
1951-1960	740,700	502,400	238,300	67.8	32.2
1961-1970	797,100	612,400	184,700	76.8	23.2
Total Next 37 Years....	2,601,900	1,684,130	917,770	64.7	35.3
Total 112 Years....	3,724,770	1,925,128	1,799,642	51.7	48.3
(1931-1940)	(466,577)	(251,190)	(215,387)	(53.8)	(46.2)

*Includes only years 1884-1890, no steel replacements estimated prior to that time.

ence between production and replacements arrived at as indicated in the two preceding paragraphs.

Table II groups into decades production of steel for replacement purposes and for new uses, as determined

The Role of the Common Elements in the Alloy Steels

SPEAKING before about 100 members and guests of the New York Chapter of the American Society for Metals (formerly the American Society for Steel Treating) at its regular March meeting, E. C. Bain, metallurgist of the United States Steel Corp., Research Laboratory, Kearny, N. J., took as his subject, "The Role of the Common Elements in Alloy Steels." His lucid address brought out several new phases, based partly on some of the work of his laboratory.

Referring to the so-called mystery which surrounded the early studies of alloy steels in general, Mr. Bain declared that today much of this mystery has disappeared because certain definite laws or principles have been discovered, though there is much yet to be learned.

Discussion Restricted

The discussion was restricted to medium and high-carbon steels intended to be heat treated, and containing only a few percentages of alloying elements, excluding such alloys as the stainless steels, Hadfield manganese steel and high-speed steel. The argument was developed along the following lines:

While large sections of plain carbon steel cannot, through heat treatment, be much controlled as to in-

ternal structure, smaller sections can be treated to yield room temperature properties only moderately inferior to those of the alloy steels. It is then only this difference which remains to be explained on a basis other than that of comparative hardenability. For large sections no hope exists for a more rapid quenching than that now employed.

Several slides illustrated how moderately the strength of steels of constant carbon content is increased by increasing alloy content when precisely the same structure is developed in all. When, however, the same heat treatment is applied to all, the properties are vastly influenced by alloy content. The major influences of the alloying elements are therefore to increase hardenability and under many present manufacturing conditions to facilitate the formation of the desired structure.

In carbon steels moderately deep hardening may be secured by severe coarsening of the austenitic grain size. A number of slides showed clearly the impairment of ductility caused by large grain size, and the accompanying presence of high internal stress as indicated by minute micro-cracks in quenched steel. When a fine grain-size is maintained, the carbon steel is shallow hardening;

from a 25-year lag. In years subsequent to 1933 the calculated trends have been inserted instead of actual production.

The table shows, if we can accept a 25-year life for steel production as being a tenable theory, that steel for new uses will rapidly give way to steel produced for replacement purposes.

It will be noted that on this basis of calculation in the decade ended with 1920 replacement steel was only 12.6 per cent and in the next decade it was 28.8 per cent.

Future decades indicate that production will consist to an increasingly greater extent of replacement steel.

Chart II shows graphically by decades from 1870 to 1970 the extent to which production was allocated to new uses and replacements as indicated in Table II. Chart III indicates the percentage of steel allocated in each decade from 1891 to 1970 to new uses and replacements as shown in Table II.

hence the alloy content should be raised for proper hardenability and a fine grain-size still maintained.

A correlation of impact strength and grain-size was set forth with a number of examples of the remarkable preservation of fine grain possible by suitable steel making processes.

Molybdenum the Most Powerful

While all elements in true solution in the steel ready for quenching increase the hardenability, some elements as usually employed act mainly to restrain grain growth by virtue of the formation of insoluble particles. Vanadium or titanium may act in this way as well as the familiar aluminum which probably forms a fine dispersion of Al_2O_3 . Molybdenum and tungsten and to some extent chromium, being partly dissolved and existing partly in undissolved particles, may, in properly heat-treated steel, act simultaneously as both deep-hardening and grain-refining elements.

A number of illustrations were employed to show how differently the several elements retard the softening of hardened steel by tempering. In order of their effectiveness they are probably molybdenum, tungsten, chromium, silicon, and nickel, the latter having little influence in this respect by virtue of its presence in the ferrite of the alloy. In general this effect of alloying elements relates to their capacity for forming dispersed particles which do not coalesce rapidly at high tempering temperatures. Residual

(Concluded on Page 82)

Alloys and Malleable Iron

By HERBERT R. SIMONDS

MANY progressive malleable foundrymen have turned to alloy additions and to anneal cycle variations to give new properties to their castings, and often, in so doing, they have carried the metal beyond the confines of a malleable iron as the term was generally understood a few years ago.

Some malleable foundrymen have taken exception with much feeling when their newly developed iron was called malleable. Others, oddly, have insisted on labeling their product "malleable" when by many old standards it was something else. This has given rise to considerable confusion and has left both the producer and the user of castings without adequate descriptive terms to cover established and familiar irons.

Speaking on this subject, L. J. Wise of the Chicago Malleable Castings Co., who is also a committee chairman of the Malleable Iron Research Institute, said:

Chromium Additions

"I think it should be made clear that there is no such thing as an alloy malleable iron containing chromium and silicon because the presence of sufficient alloying elements to have an effect on the graphitization prevents the material from ever reaching the 'malleable' stage.

"The real point is that normal malleable iron contains no appreciable amount of combined carbon and that when chromium or any other element is introduced in sufficient quantity to prevent the complete liberation of carbon from the iron carbide present in the white iron base, the resultant product cannot logically be called malleable iron."

Unchristened Alloys

Miss Rebecca Hall, consulting metallurgist, Lakeside Malleable Castings Co., Racine, Wis., whose article on alloys for malleable iron appeared on

RECENT comment on the alloying of malleable iron has given rise to the question from many sources as to just what is meant by the term "malleable iron." The accompanying symposium touches upon the significance of recent developments in the realm of alloy irons and steels and bespeaks a need for a new terminology.

page 8 of the Dec. 31, 1933, issue of THE IRON AGE, states:

"I agree with Mr. Wise's contention that chromium-silicon iron, and other pearlitic irons with similar characteristics, should not be called malleable iron. By malleable iron I understand blackheart iron generally manufactured in this country having a tensile strength about 55,000 lb., elongation about 15 per cent, good machinability, and a black fracture. This is the iron which the general public knows, buys, and uses as malleable iron.

"When the composition, method of casting, or heat treatment of the iron as defined above, are so modified as to change seriously the properties of the resulting iron, then I believe it is a new product and should have a name of its own.

"For instance, the addition of some such alloy as copper, which I understand does not seriously affect the

structure or physical properties of malleable, would result in a material which might correctly be termed an 'alloy malleable iron.' On the other hand, the addition of an alloy such as chromium, which alters one of the characteristics of malleable—its black fracture—results in an iron differing radically from malleable in structure and properties, which should not be considered a malleable iron.

"The question is, what shall these high-tensile, pearlitic irons be called? They are at present being made under different trade names, but have no designation for the class as a whole. Dr. H. A. Schwartz brought out this point in his written discussion of my paper 'High-Strength and Wear-Resistant Malleable Iron.' It was also discussed before giving the paper this title. But then, as now, the group of high-strength pearlitic irons was unchristened; and since the iron was made in a malleable foundry from a malleable base composition, it was called malleable iron."

Committee Seeks Definition

The subject of definition of malleable iron is being studied by a committee of which R. E. Kennedy is secretary, and inasmuch as a report from this committee is expected in the near future, Dr. Enrique Touceda, consulting engineer, Malleable Iron Research Institute, is inclined to discourage any outside attempt to formulate a definition at this time. However, some general comment on the character of malleable iron seems appropriate in this discussion, and Mr. Wise has given the following comparison of malleable with some other materials:

"Much has been written in recent months concerning improvements and developments of various irons, either by alloying or heat treating, or both, and produced in the cupola, the electric furnace, or the air furnace.

"The cupola products either with or without alloys are generally gray,



as cast, and are so heat-treated as to produce either grain refinement, or surface hardness, or changes in metallographic structure, depending on the properties desired. The air furnace products, and some electric furnace products, are generally white as cast and usually contain some alloying element, though not always.

Suit Product to Need

"It is with the relationship of malleable iron to the latter class that I am here concerned. My aim is to point out to the users and designers of cast parts that there is a very definite field of usefulness for the several products and that each field has its equally definite limits.

"It is not unusual to find that the producer of a new product, in his zeal to exploit it, will go beyond the limits of its logical field to the ultimate grief of both producer and customer.

"Malleable iron is a product resulting from (1) a white cast iron of such analysis that it contains no free carbon upon solidification from the molten state and which lends itself readily to (2) a heat treatment which liberates all of the carbon in the form of amorphous nodules harmlessly scattered throughout the resultant ferrite (pure iron) matrix, such heat treatment being carried out at a temperature sufficiently low as to prevent deformation of the casting.

"Close control of analysis and heat treatment in an up-to-date malleable foundry will result in a product in keeping with A.S.T.M. Specification A-47-33 Grade 35018, with the following average properties:

Tensile strength—55,000 lb. per sq. in.
Yield point—37,500 lb. per sq. in.
Elongation—20 per cent in 2 in.
Brinell hardness—130

"Such material at the ordinary pouring temperature has a fluidity almost equal that of gray iron and consequently can be cast true to pattern, in intricate designs and with excellent surface. It is the most readily machinable of all ferrous products. It has unusual shock-absorbing properties. It is highly resistant to corrosion. Also of great importance to the user, it is comparatively inexpensive and available in many localities.

Semi-malleable

"It has long been known that if the heat treatment is incomplete or if certain inhibiting alloys are added to the molten iron, all the carbon will not be liberated and the resultant product will contain more or less combined carbon either in the form of the hard cementite (iron carbide) or in the softer form of pearlite.

"In recent years some producers of malleable iron have recognized a field of usefulness for such partially malleabilized products.

"Generally speaking, such products will have a higher tensile strength and yield point, a lower elongation and a higher Brinell hardness number than normal malleable iron. They will machine less readily and will stand less shock. The cost should be appreciably greater than malleable iron.

"This should naturally limit the logical field of usefulness of such products to services where resistance to abrasion or deformation is of paramount importance and machinability, ductility and shock resistance are secondary.

"With this knowledge, the designer should be in position to decide whether he has use for such types of castings in his product.

"A further source of confusion has resulted from the promiscuous use of the terms 'quick-annealed' and 'short annealed' malleable. These terms have sprung into existence as a result of the practice in a large number of malleable foundries of annealing a por-

tion of their work in small batches, resulting in an appreciable saving of time as compared with the usual process. There is nothing mysterious or different about such castings, the savings in time being purely mechanical rather than metallurgical. They should not be confused with the 'incompletely annealed' products previously described, as the latter never are allowed to reach the true malleable state, which, to repeat, means freedom from all combined carbon constituents."

In the light of the foregoing discussion it is apparent that many of the alloyed malleable irons mentioned by Miss Hall in the article previously referred to, strictly speaking, were not malleable irons. Miss Hall states: "When foundrymen object to the presence of chromium in their iron they are speaking of normal malleable iron, but when I explain the effect of chromium on high strength and resistance to wear, I am speaking of a special iron belonging to a class of high-tensile pearlitic irons and I am anxious to correct any impression that I advocate the use of chromium in normal malleable iron."

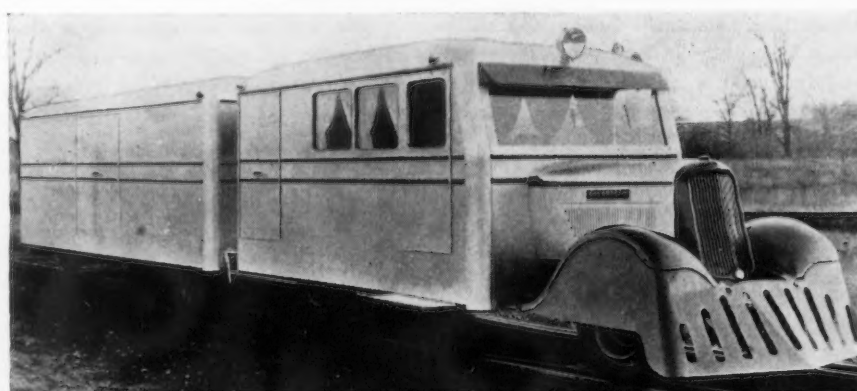
Gas Engine Supplants Steam Locomotive

THE Hillsboro & North Eastern Railroad in Wisconsin recently abandoned steam power in favor of unique gasoline units, one of which is shown in the accompanying illustration. This unit is revolutionary in design, and is similar to the larger buses in common use on the highways, but particularly adapted for railroad use. Part of the car is for passengers, and a trailer is provided for freight.

The "Railcarbus" is manufactured by the Kalamazoo Railway Supply Co., Kalamazoo, Mich., and has Met-L-Wood panels in roofs and sidewalls. The panels are made of two sheets

of Republic Steel Corp'n. galvanized steel, between which is bonded a wood and cloth core making a ply panel of metal on the outside and wood inside of sturdy and highly insulating character. Met-L-Wood is a product of Met-L-Wood Corp'n., Chicago.

The wheels of the vehicle are equipped with special pneumatic tires, so designed that a flat tire occasions less than ½ in. drop, thereby permitting the car to proceed in safety in case of tire failure. This feature also eliminates the familiar clicking on passing over rail joints, and makes for easier riding qualities.



Connecting Rod Bores Finished to High Accuracy by New Method

By JOHN E. KLINE
Chief Engineer, Hutto Engineering Co., Detroit

USE of steel-backed babbitted bearings in connecting rods has presented the manufacturer of automobile engines with a very complex problem, that of producing, with consistent accuracy, straight, round, connecting rod bores as seats for the steel-backed babbitt bearings.

A number of "shearing cut" methods for the precision finishing of these bores have been employed, but most have proved ineffective because of the variation in cross-sectional areas of the metal at various points about the circumference of the bore. At the stem and bolt ears, for example, the metal is usually sufficient to withstand the pressure of a broach, reamer or other similar cutting tool, but through the cap at the normal position of the dipper the metal is not sufficient to prevent some degree of flexure, however minute. And, as the desire for high-speed acceleration in today's engines has necessitated reduction in weight of the reciprocating parts, it is impractical to look in the direction of increased cross-sectional areas for a solution of this precision machining problem.

Precision finishing of these bores is even more imperative than heretofore because the malleability of babbitt makes it desirable, for maximum life, to apply only a very thin layer to the backs of these bearings. In consequence, any "pinch" in the steel-backed babbitt bearing caused by a tapered, bell-mouthed or out-of-round bearing seat may seriously impair its potential service.

One method of finishing such bores consists of stacking the connecting rods in a special fixture and operating a honing tool through the bores. Dimensional variations in the connecting rod faces, variations in the diameters, and the axial discrepancies of the crankpin bores in adjacently stacked rods have, however, been a source of difficulty.

After considerable study of the problem, the Hutto Engineering Co., Inc., Detroit, has developed a new method for large and small-lot honing of these connecting rod crankpin bores consistently straight, round and true to precise limits. Each connecting rod is honed individually by means of the special hone here pictured, in

combination with a fixture, also illustrated, that locates the bore concentric with the hone and holds the rod in place with a moderate, predetermined pressure during the honing operation. Suitable machines, both single and multiple-spindle, are available for this work.

The hone may be equipped with either the company's "Automatic" drive-head or with its standard "micrometer set and stop" drive-head. With the former the hone expands and contracts automatically as it enters and leaves the crankpin bore. Both drive-heads incorporate a micrometer adjustment with which to accurately predetermine the diameter of the finished bore. Only one major setting of the micrometer adjustment is required to hone a number of bores to a given diameter within

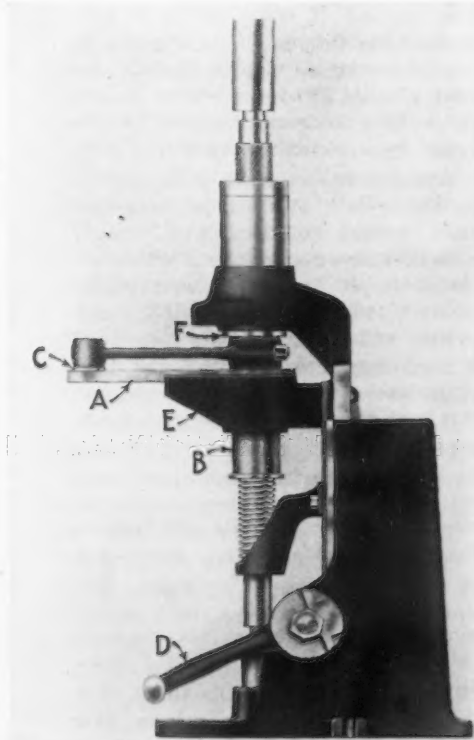
specified tolerances. In the automatic tool only an occasional adjustment is required to compensate for wear of the abrasives. A moderate but uniform pressure is applied to the abrasive members at all times during the operation of the tool, which makes for more rapid stock removal, close accuracy, higher quality of finish and longer stone life.

"Floating" action of the stoneholders permits a "universal" motion of the abrasives in relation to the axis of the rod bore, thus assuring consistent "cleaning up" of the entire bore surface even though a very small amount of stock is removed from the bore. Because of this universal motion of the abrasives, lack of squareness between the connecting rod faces and the nominal axis of the bore does not affect the accuracy of the bore produced. The automatic stop that regulates the expansion of the abrasive stones permits complete control of the ultimate bore size and eliminates the possibility of honing oversize.

Simple, Quick-Acting Fixture Employed

The fixture for use with this hone may be operated easily and quickly. It is designed to facilitate the honing of connecting rod bores round and true; as it does not distort the rod in any manner through excessive

(Concluded on Page 71)



Hone for precision finishing of connecting rod crankpin bores on either small-lot or production basis. The tool is used with the special fixture shown at left. Fixture designed to facilitate honing of connecting rod bores round and true. Excessive clamping pressure is avoided.

▲ ▲ ▲ The Waste of Uncontrolled P

MUCH is being said currently about the need for investment in new capital goods instead of investment in paper which merely transfers ownership of existing facilities—and all too frequently with heavy mark-down of value. It is being remarked that unemployment of men and machines is largely centered in those normally connected with producing durable goods. There are still many who expect the revival in the consumer goods industries will quickly spread till the buggy-wagon of business again chugs along as usual; then the only problem of the individual concern will be to see that it gets its fair share—or a little more!

The production of capital goods needs more consideration than that. It should by now be quite evident that our national economic machine is in the political shops for a major overhauling and having some of its parts redesigned. If we can include in the new mechanism some device to give greater stability to the production of capital goods, we may be able to prevent placing those industries in line for a false recovery, only to be followed by a similar setback.

Apparently even the producers of capital goods themselves have not fully realized the extent to which their activities now dominate our whole national tempo. The use of the furnace-in-blast index, charts of steel scrap prices and other indices have, of course, long acknowledged the barometric value of the steel industry. But with this vague acknowledgment, construction indices came to be looked upon as primarily barometric, indicating whether coming industrial weather would be fair or foul—a thing everyone discusses daily, but no one ever does anything about. But since Mark Twain made that classic complaint about the weather, we have manufactured climate for our comfort. It is a sign of the times that the possibilities of control in new fields of engineering and economics are receiving ever wider recognition. So it may be useful to apply some unconventional measurement to the construction industries in an effort to gauge the forces at work.

It is barely a generation ago that we began the manufacture of interchangeable parts—many of us still remember the criticism of making two parts accurately instead of only one. But today we would not have enough skilled fitters to do a fraction of our assembly work on the old basis, and we need them all in the tool rooms. And that is the general

THE welfare, or lack of it, of the capital goods industry is giving Government much concern. It has, it goes without saying, given more concern to those in it and dependent upon it for livelihood or profit.

Much study has been given by the author to the question of proper investment in capital equipment and he has arrived at some interesting and rather definite conclusions on this subject. His thesis is not an attack on over capacity as a cause of the depression, but an indictment of obsolescence or the retaining of out of date capacity. His views will be read and considered attentively by all who are now studying the capital goods dilemma.

process we have had to follow to lift our standard of living, ever stretching the available skill to go further, and transferring as much skill as possible to the machine. Examination of the record will prove that particularly in the last ten years the process has been accelerated. We are giving each worker more effective machinery to use, and with the improvement of the machine we have raised the value added in manufacture per man employed by some 35 per cent from 1921 to 1929; that is an annual increase of output per worker of nearly 5 per cent.

Of course there is no merit in providing more machinery per man unless the addition proves to be a true labor-saving device, that is, one which

saves more during its life than it takes to build it. One occasionally encounters an executive like Mr. Pushbutton who goes too far with automatic equipment—perhaps he has a “toy-complex” or perhaps he lacks skill in getting results from his men with less complex tools—he often loses his investment by obsolescence before it has paid its way. Or we find Mr. Scrooge going to the other extreme, using technically inadequate equipment—a general purpose lathe where he should have a turret lathe with two cutting stations—and he is likely to squeeze down on his wage rates to the point where enthusiasm is chilled and his men work apathetically or secretly indulge in “government work” or even sabotage; all told, he will use so much more of his low-priced labor that his net costs are too high. Or we find Mr. Thumbrule, who prides himself on avoiding the “red tape” of paper work, and only keeps a bookkeeper to look after collections; he is likely to have an excessive inventory in process and a high idleness rate of expensive machinery because work schedules are neglected.

A Golden Balance

But Mr. Forsythe, who knows the Greeks had a word for the middle road, wants to apportion his budget to attain the golden balance. So I have endeavored to set up a guide for the spending of the dollar used in converting goods bought into goods sold. In a recent article in *THE IRON AGE*, I suggested that, very broadly, maximum economy plus safety was attained when the conversion dollar was apportioned 50 cents to routine labor, 32 cents to capital charges and 18 cents to management expenses, assuming of course, efficient use of each allotment.

Frankly, I know of no accurate reason for these proportions—no more reason than that the height of the American executive seldom varies more than a couple of inches from the average 71 in. The fact is, however, that if the norm for the particular industry is not followed there is either considerable inefficiency in the

Productive Capital

By H. P. LOSELY

process, or else undue risks are taken, and the results to the enterprise are unpleasant or even fatal. It is possible that we may in the future be able to so organize our manufacturing processes that a higher proportion of capital charges will be justified; the census figures give evidence that we have been trying to do so, but the results have not been so good.

So, taking the figures as given above, we may extend them and draw some conclusions that will focus attention on the urgent need for control of capital investment in our industrial set-up.

In the first place, the very ratio suggested between routine labor and capital charges, of itself indicates that we must spend about one-half as much on construction—all the way from the factory site to the jigs and fixtures—as we spend on routine labor. But unfortunately we have as yet no compelling force to lead to the spending of the same amount each year on equipment.

Prince or Pauper

Much of our machinery will last mechanically for ten years with little attention. Consequently, all the construction industries are like steel, either prince or pauper. The consumer goods industries can operate on the principle that a depression does not outlast the second pair of pants—if the moths don't revive the textile business, style changes will. In the construction industries we cannot save ourselves with styles, nor can we carelessly handle the policy of making machinery obsolete; if we do that too rapidly we may scare off the buyer or even ruin him.

One case comes to mind of a manufacturer of heavy special machinery

The pendulum swings back—business is picking up—it is time to discard depression policies—and time to replace obsolete equipment.



who had a shrewd perception of the intangible partnership with his customers. He not only timed his new models with unusual acumen, but actually stopped production of a given machine for as much as a year before marketing a radically improved type—meanwhile giving his customers an inkling of what was coming and advising them to accumulate cash, not obsolescent machines.

How the consumer goods industries can continue for lengthy periods without their normal ration of capital goods will be more plainly seen if we examine their accumulation of fixed assets. Out of the capital charges, the greater part—about 20 to 24 cents out of the 32 cents—will go to the replacement account, for new parts, new machines or new buildings. With an average rate of making over the whole plant in eight years and a ratio of 22 cents to the replacement account for each 50 cents annual wages, we would have a total investment of 8×22 or 188 cents for each 50 cents annual routine wages. The investment per routine worker is, therefore, in the order of nearly four times his annual wage. While this figure is somewhat theoretically derived, it seems to be closely approximated in practice, except in the light manufacturing industries which are highly seasonal and very mobile, both as to location and duration; these latter are naturally nearer to the old handicraft methods which used less capital

in equipment, but more in the intangible investment in training workers. It does not apply to utilities and railroads, which of course have quite different characteristics.

A Common Ratio

It may sound peculiar that this ratio should roughly persist through a fairly wide range of industry. Apparently economic forces tend to bring about a balance somewhere near this point. Where the investment is necessarily high for technical reasons, the management finds it pays to run two, three, or even four shifts a day, and in so doing raises the routine wage bill and lowers the capital charge per hour. Conversely, where wages are high, the reaction is to invent more labor-saving machinery.

Although we have this high investment, it is well known that we do not use our capital facilities nearly as intensively as we should. That, in part, accounts for the fact that industry as a whole shows in the census reports, a labor cost of less than 40 per cent of the value added in manufacture. The ratio persisted for several years around 42 per cent, but since 1921, declined gradually to 36½ per cent in 1929. Several independent studies have been made in an attempt to determine the amount of existing surplus capacity. Much, of course, depends on the point of view—the definition of surplus. Ad-

mittedly much of the existing surplus is obsolete, but as long as it is under separate ownership, it seeks employment just as feverishly as the efficient plant, in fact rather more recklessly. So, as long as it is left standing, it is part of our problem.

I have previously expressed my belief that obsolete and excess capacity should be retired, but what I seek to bring out here in measurable form is the harm done by excess capacity—regardless of its condition. For expressed in dollars, the total is astounding and may shock some of our political leaders sufficiently to induce a grant to industry of the protection it needs for its rate of capital employment.

Destruction in Five Years

Even in the years of active business before the depression, most industries had one machine seeking a job for every two machines working. Individual machines today have a relatively short useful life, and to operate economically, should be worked with a view to destruction in not more than five years. There are, of course, some machines which have been so well designed that it seems unlikely that they will be outmoded; there are some machines in use today with their design substantially unchanged for 25 years. While the law of probability in such a case is against a change, if change does occur, it is likely to be quite radical; changes of demand for the product are also becoming more frequent. The few machines with exceptionally stable design, therefore, do not invalidate the general conclusion.

So, by running our industries with a staggering surplus of machinery and plant, we not merely lose interest on the excess capital; the greater loss is the mechanically premature scrapping of machines, not because they are worn out, but because they are technically obsolete, or else the product they make is no longer wanted.

The result in the individual plant with the average low percentage of operation is that, to maintain its financial existence, an excessive portion of its earnings must be taken out during the active period to cover write-offs. Consequently, the enterprise is financially estopped from paying out either wages, salaries, dividends—or even taxes—at the rate it could technically support under a system which would protect its operating rate. Reduced to simple terms, a plant designed with a machinery investment per worker of \$6,600, which should be able to pay an average wage of \$2,200 a year, and apply

\$1,320 each year to replacement account to completely renew the tools in five years, must instead take out \$2,200 a year for the tools during the three years it runs full capacity; so it can only pay \$1,320 a year wages during those three years, and for the other two has to lay off the men, leaving them to find other jobs—if, as and when available.

Now \$1,320 is about the average wage paid in industry during the last years of profitless prosperity. So while some of our socialist and technocrat friends may talk to the gallery about a universal wage of five or ten thousand a year, it seems to me more practical to ask for enough self-government in industry to the end that we eliminate the very real waste of unusual capital. That would make it feasible for industry to pay higher wages, graduated according to skill, but averaging nearer to \$2,000 a year and adding to it yearly by virtue of technological increment, which may be about 5 per cent a year.

What would be the immediate consequences to the capital goods industries of more intensive use of equipment—will it mean less sales? As compared with times when there is exuberant expansion, probably yes, for much of that sudden expansion in the past has been in response to a fictitious demand. More adequate information, assembled and publicized by the various trade institutes will expose the duplicate order deception and so prevent unwarranted expansion. But having prevented erection of unneeded facilities and substituted for it a more strenuous use of a rational quota of tools, even to the point of running two shifts where we now run one, obviously the maintenance expense per standing machine will go up. With less stand-by equipment and a more continuous demand for the output of the machine, any long postponement of maintenance work will be quite out of the question; we will bring the construction industries a step nearer the consumer goods in turnover rate.

Sane Handling of Obsolescence

Still more important, by holding down installed capacity to real need,



it will be feasible to handle the obsolescence problem more sanely. Equipment may be blocked out in groups according to technological age. In any case, it is sound practice to write down values of older equipment (and resulting charges to production cost) to a point where the cost of its output is brought into line with the cost on the newest machine. If this practice can be standardized, it will bring maintenance expenses under better economic control. The blocks of greatest technical age—machines almost valueless commercially—will be slated for the discard on a definite schedule, the making and stocking of spare parts stopped somewhat previously, and when one of these machines gets out of repair, it will be dismantled and replaced by one of the newest model. Schedules may call for intensive operation for four years, and service on the reserve list for a fifth year—to help with peak loads—after which it will make room for the next reserve battalion.

An executive of one of the leading textile machine makers (C. & K.) recently recommended a similar plan in a letter to *Mechanical Engineering*, pointing out how equipment not kept up-to-date for handling current construction frequently had to be left standing idle, while the trade was clamoring for quicker deliveries of up-to-date style goods.

Such a plan of using machinery will bring us still further toward the goal of stabilizing the rate of building capital goods. It would probably result in a smaller number of production machines being built in any one series, but more frequent series. Many economists have pointed to the instability of our rate of producing capital goods as a major cause of our recurrent crises, with increasing use of machinery adding to their violence. It is to give emphasis to this contention that I have attempted to apply some measurement to the factor.

It is especially important to remember that any marked change in the rate tends to add momentum like a snowball. When we begin to slow down, we throw out of work our most highly paid men and also stop the income to the capital they use; the reduction in national income begets further reductions till we nearly stop, and starting up again seems a difficult process.

More and more of us are sensing our particular share of these losses; we begin to see that Mr. Thumbrule, who begrudges the relatively modest expenditure to attain a reasonable measure of coordination, is short-

(Concluded on Page 80)

Electric Furnace Iron Highly Resistant to Abrasion

THIS article is a description of a new development which has greatly elevated the efficiency of pulverizing equipment produced by the Riley Stoker Co. As experimental wear-test data are often difficult to correlate, the ultimate requisite is that a product fulfill service expectations. After rigid operating tests, the Riloy No. 31 alloy discussed herein proved 100 per cent superior to materials previously used. The structure refinement resulting in higher abrasion resistance is ascribed to an improved melting technique in an indirect-arc electric furnace of the type produced by the Detroit Electric Furnace Co.

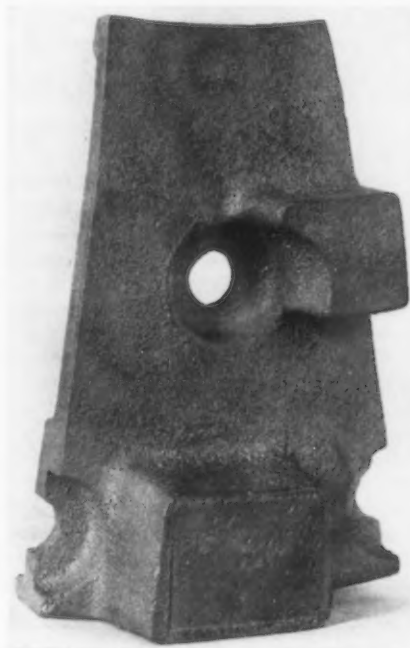
PULVERIZER equipment parts present one of the most critical problems in abrasion resistance, and this is especially true of parts known as "pegs" used in the assembly of the Atrita Pulverizer manufactured by the Riley Stoker Co., which is used to pulverize coal to be used in powdered fuel installations.

The pegs are carried on a rotating disk which travels between similar stationary pegs, and the operation constitutes the chief element in the final stage of pulverization. The fine particles of granular coal resulting from the initial pulverization stage are drawn between the moving and stationary pegs and reduced to required fineness by a rubbing or attrition process.

The Riley Stoker Co. for many years used hard white iron having a Brinell of 340 for the peg castings. This white iron was a good air furnace grade purchased under rigid specifications from a well-known producer of malleable iron. Microscopically it consisted of massive areas of pure cementite with well-defined islands of pearlite, and, chemically, the total carbon ran approximately 2.40 per cent but practically no graphitic carbon was present. Pegs made of this air furnace iron accomplished the pulverization of an average of 2024 tons of coal per 100 oz. of peg metal loss per peg. The coal used was a very hard grade of Western fuel, which, in general, is very much less friable than many of the Eastern coals.

Not satisfied with the production efficiency, the metallurgical staff of

the stoker company undertook experiments with an electric furnace white iron purchased on specific order, which later became known as Riloy No. 8 iron. This metal Brinelled 450 plus or an increase of 110 points over the previously used air furnace iron. The Riloy No. 8 iron showed an increase of slightly more than 65 per cent in the tonnage of coal pulverized per 100 oz. of peg wear over the

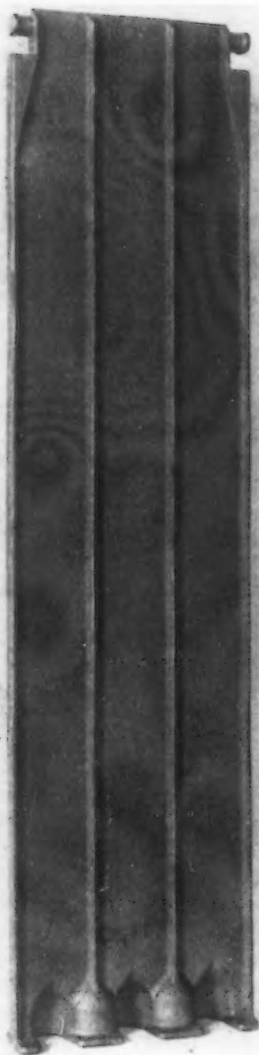


Peg casting made from Riloy No. 31 alloy melted in a Detroit electric rocking furnace. The lugs shown are subject to the abrasive action of coal particles, and wear occurs on the underside. The alloy Brinells 600, and about 5000 tons of hard coal can be pulverized for each 100 oz. of peg metal loss per peg.

air furnace metal, and, in addition, a cost reduction of 20 per cent in the finished castings was effected.

A very exhaustive investigation was then made of the effects of alloying metals on the white iron, again with the object of adding further to the peg service life. This additional study culminated in the adoption of a new alloy known as Riloy No. 31, which contains both nickel and chromium. The latter element is a carbide forming element which tends to increase the hardness of the finished casting, whereas the former element is a strong graphitizer. Nickel has a tendency to decompose cementite into graphite and pearlite, and it also usually results in an increase in tensile strength of a casting. Obviously it is not desirable to unduly increase the graphite content of the metal even though such an addition is secondary in character as graphite is a soft friable material especially vulnerable to abrasion. Consequently, in order to utilize optimum advantages of these alloying elements, a high degree of control is essential in handling the metal analyses.

In order to investigate the true significance of this high degree of control a further investigation of melting methods was undertaken. While the air furnace offers greater precision and operating flexibility than the cupola, it cannot easily duplicate the results obtainable in electric melting furnaces. The air furnace is a fuel fired unit and is, therefore, subject to all the limitations of fuel firing, and neither carbon nor silicon can be controlled as accurately as is



Scrubber plate cast from an electric rocking furnace alloy designated as Riloy No. 61. In service this alloy very successfully withstands the abrasive and highly corrosive action of flue gases.

possible in controlled atmosphere melting. Losses of the more expensive alloying elements are always liable to occur in the highly oxidizing atmosphere of the fuel fired furnace and these losses are seldom constant, therefore it is very difficult for accurate allowances to be made.

In order to obtain the degree of control considered necessary, an indirect-arc rocking electric furnace was installed in the stoker company's own plant, and assigned to the melting of the new alloy development which was called Riloy No. 31. The experimental and operating results more than justified the efforts made in the development of the alloy.

The new alloy Brinells at 600 plus, harder by 150 points than Riloy No. 8, and 260 points harder than the original air furnace iron. Its service life measured in tons of coal pulverized for each 100 oz. loss of peg

metal per peg is more than twice that of the air furnace product and 25 per cent superior to the Riloy No. 8 iron. One of these pegs is shown in the accompanying illustration.

The electric furnace is also being used in the production of a very highly corrosion resistant alloy which is finding particular application for scrubber plates and other castings which are subjected to severe flue gas conditions. This austenitic alloy is

designated Riloy No. 61, and a typical casting is shown herein.

The electric furnace is now operating on a two shift basis, and is employed for cold melting at night and for a duplexing operation during the day shift at the Riley plant. Under maximum production requirements, cold melting and duplexing are combined. This operation is a very carefully controlled ladle mixing of cupola and electric furnace charges.

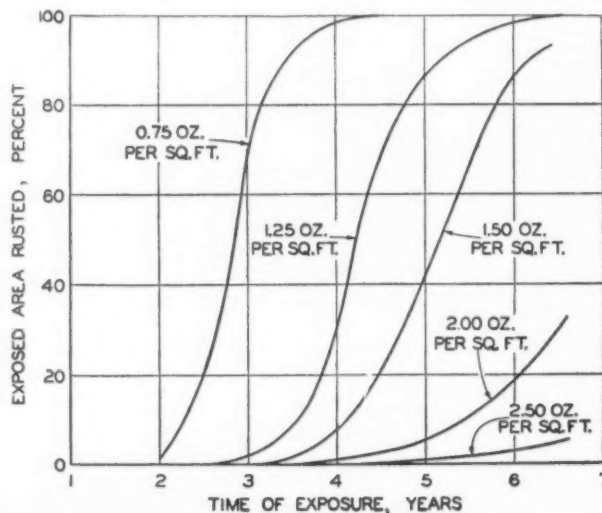
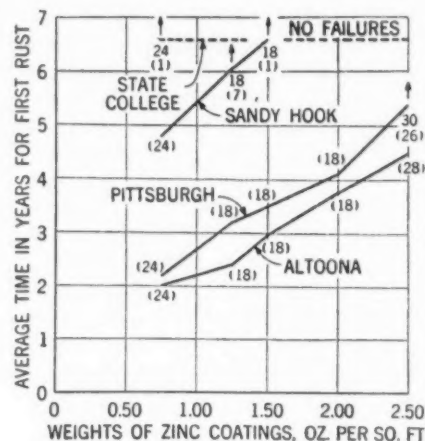
Outdoor Tests of Bare and Coated Ferrous Metals

A DETAILED study of the field exposure tests for corrosion of ferrous metal specimens conducted at various locations and for nearly 20 years under the direction of the committee on corrosion of the American Society for Testing Materials was recently made by C. D. Hocker, chemical engineer, Bell Telephone Laboratories, Inc., New York. The results he contributed in the form of a paper read before a weathering of metals session held by the society at Washington, March 7. The object of the paper was to make analyses and interpretations of a kind an engineer might attempt of the society's published data from time to time, to afford guidance in problems relating to the serviceability of ferrous metals and their finishes. This is not to say that conclusions have not been drawn by the committee from the results of tests that have been completed; instead there are the cases of tests still in progress and the fact that the records of periodic inspections of them have been published without comments or interpretations.

Summarized, Mr. Hocker offered these findings:

As regards black iron and steel sheets: While a content of copper up to at least 0.15 per cent substantially improves the corrosion resistance to the atmosphere, corresponding improvements were not found in tests under water.

As regards hot-dip zinc-coated sheets: The life is dependent on the
(Concluded on Page 78)



(Above): Outdoor life of zinc coatings on iron and steel sheets according to average time for appearance of first rust. (Numbers in parentheses indicate the number of samples that failed; those not in parentheses indicate the total number of samples.)

(At left): Progressive development of rust of zinc coatings on iron and steel sheets at Pittsburgh.

Keyseater Cuts Taper as Well as Straight Keyways

A TILTING table that permits cutting taper keyways is an important improvement in a new machine announced by the Davis Keyseater Co., Rochester, N. Y. The table may be inclined either to the right or left, and there is a scale that indicates the exact taper produced by a given setting of the table. Thus taper as well as straight keyways are cut by these machines, three sizes of which are available. Simplicity and ease of operation are general features emphasized.

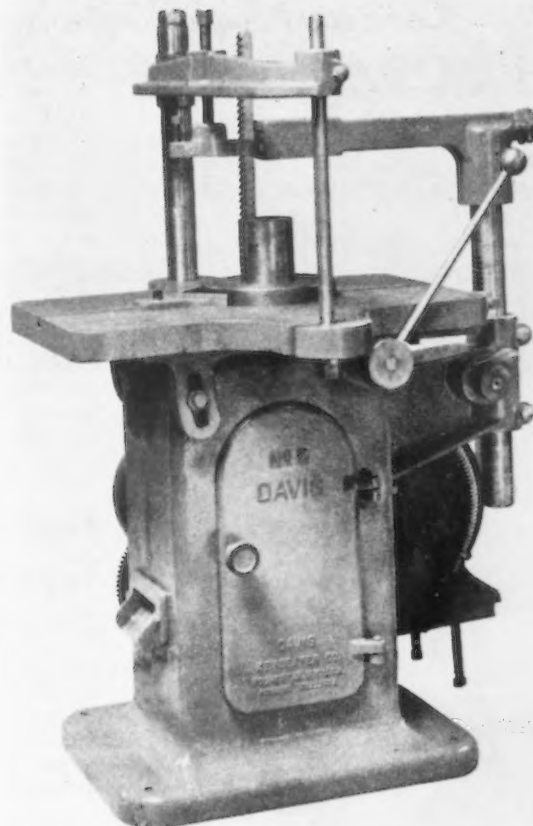
A cutter of saw or broach form several teeth of which cut simultaneously is employed. The cutter is reciprocated by means of a crosshead which is adjustable to bring the tool central with the work. The work is set over a bushing that is clamped to the table by a bushing holder. A slot in the bushing serves to guide the cutter and to hold it in proper relation to the work. The work is held down to the table by a swinging clamp bar which may be swung to the left to permit removal of the work without disturbing the nut on the holding down stud.

The cutter is set up in a vertical position and remains vertical during the entire keyseating process. It is backed up by a resistance arm, which may be adjusted for cutters of different widths or depths and work of various heights. The feed is of table type, operated by a hand-lever and a pinion that meshes with a rack attached to the table. An accurately adjustable stop is provided for the table feeding movement.

Cutters, made either of carbon or of high-speed steel, are available. They are 16 in. or 20 in. long, according to the width of keyway to be cut.

Specifications for the smallest and largest machine respectively include: Sizes of keyway cut, 1/16 to 1/2 in. and 1/16-1 1/2 in.; length cut with 16-in. cutter, 4 1/2 in. and 3 1/2 in.; length cut with 20-in. cutter, 4 1/2 and 7 1/2 in.; maximum swing between posts, 16 and 30 in.; and maximum height 4 1/2 and 14 in. Pulleys or other spoked work can be handled in diameters larger than those indicated in the foregoing, which applies to solid blanks. For high work or long bores, longer cutters and higher studs and collars for the swinging clamp bar

▲ ▲ ▲
The table can be tilted either right or left. The exact taper produced by a given table setting is indicated on a scale.
▼ ▼ ▼



can be furnished. Either motor drive arrangement, with a 1 1/2 or 2-hp. motor, or belt drive, with tight and

loose pulleys, can be furnished. The net weight of the smallest machine is 600 lb. and of the largest 1200 lb.

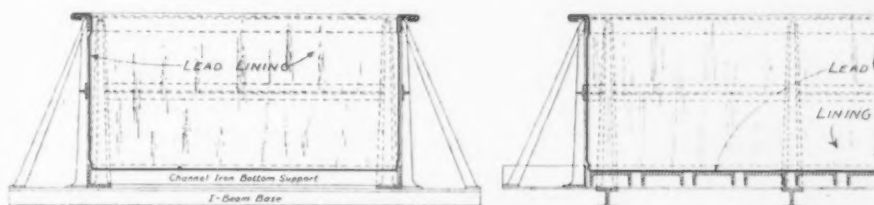
Pickling Tank Designed for Economical Installation and Repair

A LEAD-LINED pickling tank featuring economical construction and maintenance has been designed by Dietzel Lead Burning Co., contractor in lead work, Keystone Building, Pittsburgh. This tank is constructed of steel members, and lined with chemical lead. Steel shapes available on the premises may be used, and the steel work may be done by labor drawn from the plant at which the tank is to be installed.

Construction of the tank may be seen in the illustration. The base may be made up of I-beams as shown, or of steel rails or other structural steel shapes now classified as scrap or short ends. Steel angles are placed on this base to support steel channel

members at intervals of about 2 or 3 in. The sheet lead lining rests directly on the channel cross members, and is carried up the sidewall and over the top angle. The sidewall frame is bolted or welded to the bottom and top angles. Outer bracing can be accomplished by extending every other base beam and by putting a brace to the top of the sidewall. These braces may consist of buck-staves, I-beams or other available structural steel.

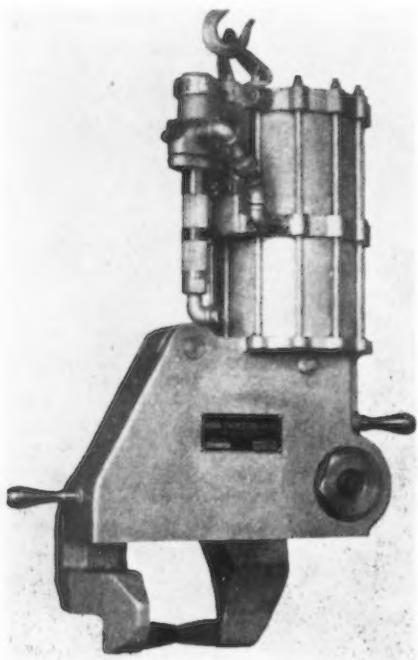
Facility with which repairs may be made and parts replaced without disturbing the tank as a whole is a feature emphasized. Cost of the sheet lead lining, which is supplied and installed by the Dietzel company, is said to be no more than that of a solid tank.



Repairs and replacements may be made without disturbing the pickling tank as a whole.

Compact Alligator-Type Squeeze Riveter

HANNA ENGINEERING WORKS, 1765 Elston Avenue, Chicago, has developed a new light, compact squeeze riveter of "alligator" or "nut-cracker" type. The mechanism, entirely inclosed, consists of a roller and

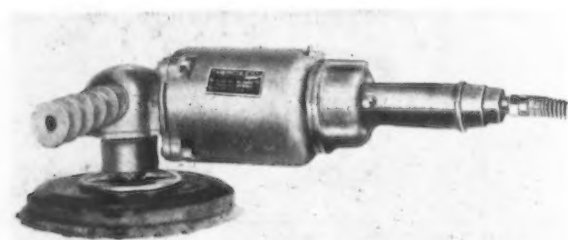


toggle which transmit the power movement of the cylinder piston unit to the moving die. A known and predetermined tonnage is exerted on the dies regardless of considerable variation in length and thickness of the rivet. Minimum of power consumption is claimed.

The riveter here illustrated develops 20 tons between the dies, which is sufficient for heading $\frac{3}{8}$ -in. diameter cold and $\frac{1}{2}$ -in. diameter hot rivets. The die stroke is 2 in. Both jaws of the alligator-type riveter can be entered into a pocket or pockets to head a rivet. Considerable variation in the reach and shape of these jaws is possible.

Portable Polishing and Sanding Tools

NEW high-frequency portable electric tools added to the line of the Buckeye Portable Tool Co., Dayton,



A high-frequency motor is employed and handles are insulated.

Ohio, include one for rubbing down and polishing lacquer and another for sanding. Both are of the same construction but the latter has a speed of 4700 r.p.m. and is equipped for sanding or grinding with abrasive disks or cup emery wheels. The motor is cool running and the handle of the tool is insulated from the body. The ventilating system is such that dust is blown away from the operator.

The overall length of these machines, designated as the No. 57-1800 polishing and rubbing tool and the 56-4700 sander respectively is 16 $\frac{1}{4}$ in. The net weight is 10 $\frac{1}{2}$ lb.

New Low-Resistance Type Pyrometer

RUGGED, durable construction together with accuracy are claimed for the "Hold-Heet" pyrometer recently placed on the market by the Russell Electric Co., 358 West Huron Street, Chicago. This instrument is of direct-reading type and has manual cold-end correction adjustment. It



has a total resistance of 10 ohms. It is made in three standard temperature ranges, namely, 60 to 800 deg. F. 60 to 1600 deg., and 50 to 2500 deg.

Thermocouples are heavy, No. 6 gage, and extend direct from the meter to the point where the temperature is to be measured, thus eliminating connection leads. This is said to result in a total variable external resistance that is less than one part

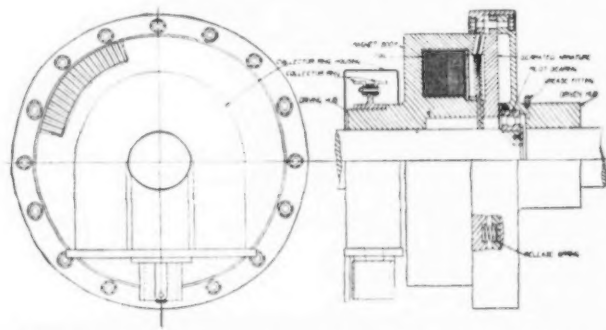
in 150 parts of the meter resistance. It is stated that with the resulting large current flow the pyrometer is able to employ a rugged movement that will not easily get out of order, together with substantial control springs that make the meter practically dead beat. With the portable type Hold-Heet pyrometer which is also available the different thermocouples used have nearly the same electrical resistance. It is, therefore, possible to calibrate the meter with an external resistance equal to the average resistance of the different thermocouples. This is said to reduce the maximum possible error due to external resistance to even less than 1 part in 150.

The hexagonal aluminum case of the type shown is designed so that the pyrometer extension leads may be attached to the top, the bottom or either side of the case. This type is offered for use as standard equipment on ovens, furnaces, etc. The pyrometer lance has aluminum handle.

Improved Magnetic Clutch-Coupling

QUICK and positive engagement features the magnetic clutch-coupling illustrated, which is an improved model brought out by the Dings Magnetic Separator Co., Milwaukee. The contact surfaces are of serrated V-tooth character to assure positive engagement when the magnet coil is energized. These serrations are of 3 deg. angle pitch and of equal depth over the entire surface of the contact face. The faces of the magnet and the floating armature are parallel and at an angle to the shaft. Mounting of the ball pilot bearing on the shaft assures correct alignment and thereby true engagement of the serrated facings. Following the usual practice, the magnet coil is form wound and vacuum pressure impregnated. The slip rings and brush holders are protected by dust-proof housings.

This clutch-coupling permits ready separation and removal of one shaft without disturbing the shaft mounting of the companion element and is said to have particular advantages in connection with mill screwdowns.



Positive mechanical engagement features this magnetic clutch-coupling.



THE NEWS OF THE WEEK

Wage Increases General in Steel Industry—Labor Still Unsettled

THE United States Steel Corp. announced last week that its various manufacturing companies, after meeting with their employee representative groups, have agreed upon an advance of approximately 10 per cent in wage rates subject to such adjustments as may be found desirable and mutually satisfactory. In addition, all the lesser salaried employees were advanced 10 per cent. The changes were effective April 1.

The remainder of the major steel and iron producing companies took similar action, following the announcement of the Corrigan, McKinney Steel Co., Cleveland, which was made on March 27.

The General Electric Co. also announced a 10 per cent pay increase to all employees receiving \$2,600 a year or less, either on salary or hourly rate. Its increase affected 38,000 to 40,000 employees. Approximately 400,000 employees of the steel industry will share in the increased remuneration.

While this action was apparently taken as the result of the President's request for higher wages and shorter hours in an effort to stimulate the recovery program, no mention of a reduction in hours was made in the steel company statements. This was believed to have been occasioned by the fact that steel company employees are now averaging only 29 hours a week because of the comparatively low operating rate.

Labor Trouble Still Evident

WASHINGTON, April 3.—Despite the action of the iron and steel industry in granting wage and salary increases during the past week, labor difficulties had by no means disappeared. The National Labor Board took under advisement the wage dispute of the Rainey-Wood Coke Co., subsidiary of the Alan Wood Steel Co., Swedeland, Pa., involving

a claim of coke plant workers for a 46c.-hr minimum rate while the company insists the rate of 41c. which is being paid is the proper one. Coke Workers Local 18467 contends that since about 25 per cent of the company's coke production normally is sold in the open market, the new basic wage rate should be brought into harmony with competitive rates, ranging from 46c. to 58c.

H. C. Thomas, of the Alan Wood company, told the board that it is ridiculous to separate the coke operations of the steel plant, even if the product were sold in the open market. He also explained that a consolidated balance sheet of the steel plant would show losses for the past four years, that wage rates could not be raised further and that the question would not be arbitrated as had been recommended by the Philadelphia regional board.

Laclede Steel Election

At St. Louis the Amalgamated Association of Iron, Steel and Tin Workers appealed a majority decision of the St. Louis Regional Labor Board which refused to order an election at the plant of the Laclede Steel Co. Chairman Robert F. Wagner of the national board directed the St. Louis board to determine whether a substantial number of employees of the company desire an election.

The first settlement of a labor controversy under the President's formula, expounded in connection with the automobile dispute, has been made in the case of the E. G. Budd Mfg. Co., Philadelphia. The principles were adopted as a policy rather than in detail, a fact explained by the wider ramifications prevalent in the automobile industry than in the case of the Budd company, builders of automobile bodies. In announcing the settlement, General Johnson said that the Budd company, which operates under the automobile code, had agreed

to lay off employees when necessity arose for reduction of its force in the same manner as that provided in the President's formula.

According to this agreement, when dealing with reduction of the number of employees, first consideration is to be given to married men and the next to seniority and efficiency. Following this, men belonging to the different labor organizations are to be laid off proportionately to their organization membership, with equality of recognition as between the company union and the outside union, in this case the American Federation of Labor.

Terms of settlement were accepted by both sides and were announced by General Johnson as follows:

1. It is understood that in the production and shipping departments during the next 90 days, Mr. Budd will reemploy at least one of the strikers out of every two men hired. It must be understood that there will probably not be any great increase of the total force but replacements will create considerable employment.
2. In laying off men he agrees to lay them off in line with the provisions of the President's agreement reached with the National Automobile Chamber of Commerce.
3. In addition, but with no connection with paragraphs 1 and 2, on his own motion, Mr. Budd spontaneously offered to undertake a clean-up operation at his plant in order to relieve the distress of some of the strikers. While this employment will be of short duration and at wages appropriate to the job, it is hoped that it will help a part of the men.

General Electric Plants Vote

The Electrical Industry Employees' Union, recently formed independent organization, which is not affiliated with the American Federation of Labor, scored the greatest vote at an election at the River and West Lynn plants, Lynn, Mass., of the General Electric Co., held last week. P. A. Donoghue acted as the representative of the National Labor Board, which supervised the election in conjunction with the New England Regional Board. The A. F. of L. was a decidedly poor third. The Electrical Industry Employees' Union registered 2122

votes at the River plant against 1150 netted by the company union and only 66 for the American Federation of Labor. At the West Lynn plant the newly formed independent union scored 651 votes as against 363 for the company union and only 19 for the American Federation of Labor. These votes do not include a small lot of scattering votes and blank votes, including those that were contested.

National Lock Dispute

The National Labor Board granted the National Lock Co., Rockford, Ill., a short time to offer certain proposals regarding settlement of a labor dispute at its plant. Roy Hall, the company's general counsel, appeared before the board to show cause why its case should not be referred to the Department of Justice for action and to the Director of Compliance for removal of the Blue Eagle.

The board meanwhile has issued election regulations designed primarily to cover situations where a board election might be requested merely to give sanction to an agreed arrangement between employers and employees. The regulations specify that a board election can be invoked only where there is a real conflict over the desires of a petitioning group which are denied by an employer to another group of employees.

Inland Steel Earns \$166,693 in 1933

INLAND STEEL CO., Chicago, reports \$166,693 consolidated net profit in 1933, equal to 13c. on 1,200,000 outstanding shares. In 1932 net loss was \$3,320,958. Net sales in 1933 totaled \$27,554,644 against \$15,178,140 in the previous year. Rate of operations in 1933 was 42.3 per cent of capacity against 22.3 per cent in 1932.

In their annual message to stockholders L. E. Block, chairman, and P. D. Block, president, reported that during the year the company completed all payments on account of settlement of Federal taxes for years 1918 to 1927. Settlement was effected for taxes covering the period 1928, 1929 and 1930 early in 1934. The report indicates that earnings for the first two months of 1934 will show a substantial improvement over the earnings of the fourth quarter of 1933.

Research looking toward improving the quality of copper alloy castings is being sponsored by the Falcon Bronze Co., Youngstown. This research project, which will be conducted at Battelle Memorial Institute, Columbus, Ohio, has been announced by Dr. H. W. Gillett, director, who has designated C. H. Lorig to take charge of the project.

Illinois District Court Enjoins Laclede Picketing

FEDERAL Judge Charles G. Briggles of the Southern District of Illinois, on Wednesday, March 29, granted a permanent injunction to the Laclede Steel Co. of Alton, Ill., restraining 61 defendants from interfering in any manner with the operation of the company's plant.

Defendants in the case included about 25 former employees of the company and the remainder were professional organizers for the Amalgamated Union of Iron and Steel Workers, an association affiliated with American Federation of Labor.

The Laclede Steel Co., a Missouri corporation and the Laclede Tube Co., a Delaware corporation, brought the suit in Federal court, and sought relief through the Norris act. In their original bill, attorneys for the steel company contended that the company accepted the code of fair competition in pursuance of the NRA and have complied with all the laws of the code in regard to wages and hours of work.

It further stated that employees of the plant, numbering more than 600, adopted an employees' representation plan for advancing the interests of the workers and that a large percentage of the employees joined this organization.

On Dec. 18, the original bill set out, a number of acts of violence were reported and these skirmishes between factory workers and outsiders were such that the workers were forced to remain in the plant, being afraid to go to their homes due to action of pickets.

The company asked the assistance of the sheriff of Madison county and the chief of police of Alton in dealing with the pickets, but they were unwilling to protect the plant and its workers, the bill declared.

Most of the acts of violence, and these included shootings and the injuring of a number of people, were carried out by persons other than the steel company's men on strike.

Unable to get protection from the city and county policing bodies the company came into Federal court for relief. On Jan. 19, a temporary stay order was granted by Judge Briggles and on Jan. 25 the temporary restraining order was granted.

Arguments on the permanent injunction, which the company sought, occupied three days in court and 30 witnesses, including Governor Henry Horner of Illinois, took the stand.

Governor Horner was a defense witness, being called by Manuel M. Wiseman, Alton attorney, who represented the defendants. Governor Horner tes-

tified that no request was made to him by officials of Madison county for State militia or State police to patrol the strike area.

The defense claimed this was a point in their favor as they interpreted Norris act as meaning that plaintiffs could not go into Federal court for relief until they had exhausted all means of seeking law enforcing agencies to stop violence.

Judge Briggles, however, in his decision, declared that paragraph E of Norris act, section 107, which states that all law enforcing agencies must be confronted before a case can be taken to Federal court, does not mean enforcing bodies of the State. He declared "it would seem that it was the intention of Congress in passing the act to specifically exclude the chief executive of the State and to include only the police officers of the county and city wherein the acts of violence occurred."

"We are without court precedent upon the construction of this act," Judge Briggles continued, "but if we resort to the debates in Congress at the time the act was under consideration, we will find that this construction fully expresses the intention of Congress."

Wage-Earner Total Highest Since 1930

MORE wage-earners were at work in manufacturing industry in February, 1934, than in any other month since October, 1930, and their average earnings, both weekly and hourly, were larger than in any month in the last two years, according to the results of the regular monthly survey of the National Industrial Conference Board. Increases in February over January, 1934, were as follows: Employment, 4.7 per cent; average weekly earnings, 4.9 per cent; average hourly earnings, 1.3 per cent; and payroll disbursements, 9.7 per cent.

Average weekly earnings of all wage-earners in manufacturing industry rose from \$18.89 in January to \$19.81 in February, and reached a point 36 per cent above the low of \$14.56 in March, 1933. Among the industries in which notable gains in average weekly earnings were recorded from January, 1934, to February were: Automobile, from \$22.32 to \$24.40; boot and shoe, from \$19.68 to \$21.35; hosiery and knit goods, from \$14.19 to \$16.64; lumber and millwork, from \$15.27 to \$16.51; rubber, from \$22.95 to \$26.19; silk, from \$14.94 to \$16.86; wool, from \$16.42 to

\$17.25; and foundries, from \$15.55 to \$18.05.

Quickening of industrial activity increased weekly hours of work from 34.3 to 35.5, or 3.5 per cent. Increased hours were reported in 20 of the 25 industries covered in the survey, and in the five exceptions the decline in hours was slight. Owing to increased employment and increased hours, man-hours were 8.5 per cent higher in February than in January. The increase of 8.5 per cent in total man-hours and 1.3 per cent in average hourly earnings produced a 9.7 per cent increase in payrolls.

The increase in average weekly earnings of 4.9 per cent more than offset the rise of 1 per cent in the cost of living, so that the purchasing power of the wage-earner's weekly pay envelope recorded a net advance of 3.7 per cent, bringing it up to 95 per cent of the 1923 average.

River Steel Movement Light in February

MOVEMENT of iron and steel products on the Ohio River in the Pittsburgh district in February amounted to 4373 net tons, contrasted with 54,109 net tons in January, 36,038 tons in December, and 23,614 tons in February, 1933, according to the latest report of the United States Engineer Office at Pittsburgh. Shipments of steel products on the Monongahela River in February aggregated 12,429 tons, compared with 27,158 tons in January and 17,904 tons in February, 1933. Shipments of iron and steel on the Allegheny River in February totaled only 520 tons.

Annual Convention of Gear Manufacturers

THE annual meeting of the American Gear Manufacturers Association will be held at the Penn-Lincoln Hotel, Wilkesburg, Pa., the headquarters of the association, May 3 and 4, 1934.

A Correction

HERR KARL SCHRÖTER has asked that several corrections be made in his article concerning hard metal carbide theory which appeared in the Feb. 22 issue of *THE IRON AGE*.

In the second column of page 21, volume temperature should read room temperature, and in the third column of the same page, first line of a new paragraph, the word similar should be deleted. In addition, Herr Schröter prefers that lattice be used instead of screen throughout the article.

Nickel Output Finds Variety of Uses

IN its report to shareholders, the International Nickel Co. of Canada, Ltd., stated that nickel demands noticeably improved during 1933. The company attributed the betterment in activity to a fully maintained research and development program.

In reviewing the industry, the diverse uses of nickel were listed as follows:

	Per Cent
Alloy steel used in motor cars, trucks and buses.....	20
Nickel silver and nickel copper alloys for a multitude of uses.....	18
Pure rolled nickel in the form of rods, strip, wire, and tubes, used largely in the radio, in the chemical industries and for coinage.....	17
Alloy steel, inclusive of stainless steel, used in railroad equipment, farm implements, general machinery and numerous miscellaneous applications.....	15
Nickel for plating and as undercoat in chromium plating.....	10
Monel metal used for many Engineering purposes and for household equipment.....	9
Alloy cast iron—castings of all kinds.....	4
Miscellaneous uses including magnetic alloys, nickel brasses, nickel bronzes, nickel aluminum alloys and white gold.....	4
Heat resistant and electrical alloys.....	3

Criticizes Security Legislation

REGULATORY legislation, such as the proposed national stock exchange bill and the present securities act, was sharply criticized by George H. Houston, president, Baldwin Locomotive Works, Philadelphia, and chairman of the capital goods committee of the NRA, in an address before the Economic Club of Chicago last week. He pointed out that drastic regulation of this kind simply is an instrument which will throttle the flow of private capital into industry and provide handicaps under which private enterprise cannot live.

Mr. Houston explained the anomalous situation wherein the Government is sponsoring regulatory measures with respect to the issuance of securities and at the same time is trying to pump capital into industry. He contended that unless we are prepared to abandon capitalism and adopt a social order in which facilities of production and distribution are owned or controlled and financed by the State, the accumulation of private savings and their flow into investment in durable goods must be continued. This can be accomplished only under conditions that will give reasonable ex-

pectation of security of principal and such rate of exchange as will encourage men to take the hazard of investment.

He cited a number of conditions which, in his opinion, must be established before private enterprise will again resume normal activity. In the first place the Government must co-operate with the national forces of recovery, primarily through removal of legislative barriers that check the flow of private capital into private enterprise. There should be organized intermediate credit banks for industry, these banks to make loans up to five year maturities. The Government should adopt a policy of encouragement to private enterprise, with an assurance of freedom of opportunity to earn in the future a reasonable return upon invested capital. There should be radical changes in existing methods of doing business which are thrust upon the country by a small minority in the guise of reforms which are neither wanted nor needed. Finally, there should be equality in relations between employer and employees.

Pennsylvania Railroad Electrification Orders

ORDERS totaling \$3,500,000 for electrical equipment and insulators, in addition to 2,500,000 lb. of bare wire and cable have been placed by the Pennsylvania Railroad. This material will be used in the railroad's electrification work now actively under way between New York, Philadelphia, Baltimore and Washington. Since early in February the Pennsylvania has placed orders aggregating almost \$13,000,000 for materials and supplies used in connection with its extensive electrification and equipment building program financed by PWA.

The following companies shared in the orders for electrical apparatus and insulators: Allis-Chalmers Mfg. Co., Milwaukee; Condit Electrical Mfg. Corp., Boston; General Electric Co., Philadelphia, Pittsfield, Mass., and Erie, Pa.; Lapp Insulator Co., LeRoy, N. Y.; Locke Insulator Co., Baltimore; Ohio Brass Co., Barberton, Ohio; Railway & Industrial Engineering Co., Greensburg, Pa., and Westinghouse Electric & Mfg. Co., Pittsburgh and Derry, Pa.

The orders for bare wire and cable were placed with the following companies: General Cable Corp., Perth Amboy, N. J.; Graybar Electric Co., Worcester, Mass.; Anaconda Wire and Cable Co., Ansonia and Waterbury, Conn.; Bridgeport Brass Co., Bridgeport, Conn.; Copperweld Co., Glassport, Pa.; Phelps-Dodge Copper Products Corp., Bayway, N. J., and J. A. Roebling's Sons Co., Trenton and Roebling, N. J.

PERSONALS

D. S. EDDINS has been appointed vice-president and general manager of the Plymouth Motor Corp., Detroit, division of the Chrysler Corp. He has been connected with the staff of the Chrysler Corp. since last December. A native of Waco, Tex., he was first employed in a locomotive repair and maintenance shop, and then joined the service staff of an automobile company. For many years he has had an enviable record in high executive positions with leading car manufacturers. In his new position he will be closely associated with P. C. SAUERBREY, vice-president and production manager, and H. G. MOOCK, general sales manager. B. E. HUTCHINSON is president and chairman of the board of Plymouth Motor Corp.

WILLIAM SCOTT has been named factory manager of the Detroit drop forge and spring plants of the Chevrolet Motor Co. He formerly was general superintendent of the motor plant at Flint, Mich. A. G. SULLIVEN will be general superintendent of manufacturing at Flint under ARNOLD LENZ, general manager at Flint, Saginaw and Bay City. M. K. HOVEY has been appointed general superintendent of the Flint motor plant, continuing also in the capacity of chief inspector. I. B. SCOFIELD, master mechanic of the motor plant, becomes general night superintendent and is succeeded as master mechanic by S. J. KAISER. H. F. HOWARD is the new superintendent of the Flint assembly plant. He formerly was manager of the commercial body plant at Indianapolis.

W. SCOTT MILNE has been appointed production manager of the Chicago plant of the Ingersoll Steel & Disc Co., division of the Borg Warner Corp., Chicago. This new position, created for Mr. Milne, was necessitated by the growth in the business which is greater than at any time in the company's history. Mr. Milne has had many years of experience in the forging and fabricating of iron and steel products. During the war he supervised the production of shells. Following the war he was general superintendent of the Fairbanks, Morse & Co. plant in Quebec; superintendent of the Massey-Harris Co.'s Toronto plant; and, more recently, factory manager of the Batavia, N. Y., works of the Massey-Harris Co.

R. L. AHEARN, of New York, has been appointed Administration member of the code authority of the anti-friction bearing industry. WILLIAM D. WARD, also of New York, has been appointed to a similar position on the code authority of the horseshoe and

allied products manufacturing industry.

R. H. BINNS, JR., and S. H. WILSON have been named assistant general sales managers of Revere Copper & Brass, Inc., with headquarters in general sales department, New York Central Building, New York. Mr. Binns will devote his time principally to merchandise sales which, in general, includes those products sold through distributors for resale. Mr. Wilson will specialize on sales to industrial consumers. Mr. Binns has been manager of the Pacific Coast sales district with office in San Francisco. Mr. Wilson comes to New York from the Michigan division of Revere in Detroit, where he has been assistant sales manager.

PROF. NEIL P. BAILEY, of the mechanical engineering staff at the University of North Carolina, Chapel Hill, has been appointed head and professor of the mechanical engineering department at Iowa State College, Ames. Professor Bailey, 33 years of age, is the youngest department head ever appointed at Iowa State. During nine years of teaching and research he has specialized in thermodynamics and heat flow, and aerodynamics and fluid mechanics. He is to replace PROF. WARREN H. MEEKER, who will retire as active head of the mechanical engineering department, but will continue as a full professor.

P. W. BOWERS, P. W. Bowers & Co., New York, was elected president of the New York chapter of the Institute of Scrap Iron and Steel at the annual meeting. Other officers elected include: First vice-president, DAVID STRAUSS, Continental Iron & Steel Co., New York; second vice-president, THOMAS F. KELLY, Brooklyn; secretary, GEORGE BETTEN, S. Betten & Sons, New York, and treasurer, JOSEPH MOSKOWITZ, M. Samuel & Sons, Inc., Brooklyn. The New York chapter also elected a local code authority, consisting of THOMAS F. KELLY; WILLIAM E. FRIEDMAN, William E. Friedman Co., New York; H. GOLDSTEIN, Morgan Scrap Iron & Steel Co., Inc., Brooklyn; J. E. FISHMAN, Mutual Scrap Iron & Metal Co., New York; GEORGE BETTEN, and GEORGE KASDEN, H. Kasden & Sons, New Haven, Conn.

E. J. STAHL, Baker-Raulang Co., was elected president of the Cleveland branch of the National Metal Trades Association at its annual meeting March 28. Other officers elected include: Vice-president, P. E. BLISS, Warner & Swasey Co.; treasurer, W. C. SAYLE, Cleveland Punch & Shear

Works Co.; executive committee, LOGAN MONROE, Eaton Mfg. Co.; P. A. GEIER, P. A. Geier Co.; J. D. COX, JR., Cleveland Twist Drill Co.; H. L. GADDIS, Globe Machine & Stamping Co.; L. W. GREVE, Champion Machine & Forging Co., and T. H. DOAN, JR., Foote-Burt Co.

C. C. ROSSER, formerly district sales manager at Cleveland, for the Detroit Seamless Steel Tubes Co., has been transferred to Detroit as district sales manager, succeeding the late ROY BERRYMAN. Mr. Rosser was located in Detroit about 10 years ago.

B. B. WEINBERG, formerly a director and vice-president in charge of sales of the Heppenstall Co., Pittsburgh, and heretofore vice-president and treasurer of the Heppenstall Razor Co., Newark, N. J., has resigned to become vice-president and treasurer of the American Shear Knife Co., Homestead, Pa., manufacturer of alloy steel shear knives and high grade steel mill forgings. He was connected with the Heppenstall company for over 18 years, serving in the various capacities of clerk, production manager, general superintendent, and general sales manager.

WILLIAM H. POUCH was elected president of the Concrete Reinforcing Steel Institute at its tenth annual meeting held March 14 and 15 at the Edgewater Beach Hotel, Chicago. GEORGE E. ROUTH, JR., and H. H. STRAUS were named vice-presidents. Directors elected for three years were CHARLES M. GUNN, J. W. JONES, C. LOUIS MEYER, and ALBERT WEIHL. Directors elected for two years were E. E. GREIST, O. W. IRWIN, D. B. KNOWLTON, and E. W. LANGDON. Directors elected for one year were HUGH J. BAKER, B. M. BOISSEAU, RALPH HEALY, and W. J. KIBLER.

Subsequent to the general industry meeting, as provided in the by-laws, the board of directors elected C. LOUIS MEYER as treasurer of the institute and R. W. JOHNSON as secretary. O. W. IRWIN and E. W. LANGDON were elected to the executive committee.

WILLIAM F. SAILER, formerly with Alco Products, Inc., and the Griscom-Russell Co., has become identified with Steel & Tubes, Inc., Cleveland. He will be located in the Brooklyn, N. Y., office and will specialize in the oil refinery and marine fields.

CHARLES J. NIEMAN, secretary-treasurer, Penn Iron & Steel Co., Creighton, Pa., was guest of honor at a recent testimonial gathering of 200 friends and business acquaintances in commemoration of his 64th anniversary. Attending the occasion were a number of steel executives from the

Tri-State district. Mr. Nieman was presented with a brief case from employees of the plant.

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EDWARD A. KRELLER, works manager of the Detroit Gray Iron Foundry and the Detroit Alloy Steel Co., has been elected to the board of directors of the Detroit Alloy Steel Co.

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WILLIAM H. SMITH, president, General Reduction Corp., Detroit, and JULIUS A. CLAUSS, chief engineer, Great Lakes Steel Corp., Ecorse, Mich., addressed a meeting of the Detroit chapter of the American Society of Mechanical Engineers on March 28. Members and guests made an inspection tour of the Great Lakes Steel plant in the afternoon, after which dinner was served in the company's restaurant. The group then adjourned to the Ecorse High School auditorium for the speaking program.

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J. H. BENDIXEN has been made chairman of the board, first vice-president and manager of sales of the Bettendorf Co., Bettendorf, Iowa. E. J. BETTENDORF has been elected president and treasurer to succeed his father, the late J. W. BETTENDORF.

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L. R. SNEELLING, who has been identified since 1929 with the National Radiator Corp., Johnstown, Pa., has been appointed manager of planning and distribution. C. L. CROUSE, vice-president of the corporation, will direct all branch and divisional sales activities. PAUL J. BRACKEN, until recently manager of the Cincinnati office, has been placed in charge of the company's Boston office, 250 Stuart Street. FRED R. DANNIES, who joined the company in 1928, has been made New York manager, and RUDOLPH A. SCHMICKER, assistant manager, with office at 55 West Forty-second Street.

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W. P. EWING, assistant general manager of sales, Superior Steel Corp., Pittsburgh, has been appointed general sales manager. He has been connected with the company for about 17 years. At the company's recent annual meeting, F. R. FROST was reelected president; J. E. WETZEL, vice-president, and C. D. CLANEY, secretary-treasurer. N. K. SCHALLER was made comptroller and assistant treasurer, and D. W. LIDDELL was appointed assistant secretary.

Mitsui & Co., Ltd., recently purchased 50 tons of oil well casing from an American steel company for the Nakano Oil Co., Japan. Kitakarafuto Oil Co., Sagalien, Japan, is in the market for 100 tons of oil well casing, but the order will be allocated to European makers.

OBITUARY



FRED A. GEIER

FRED A. GEIER, president of the Cincinnati Milling Machine Co., died at his home from a heart attack last Tuesday. He was 67 years of age.

Mr. Geier was born and educated in Cincinnati. Upon his graduation from high school in 1884, he entered the banking business in Newton, Kansas, but two years later he returned to Cincinnati where he became associated with the Cincinnati Screw & Tap Co., which, in 1889, became the Cincinnati Milling Machine Co.

During the early part of this century, Mr. Geier conceived the idea of establishing a machine tool colony in Oakley, on the outskirts of Cincinnati and the Milling Machine company was among the first to build its plant there. The colony grew until at the time of Mr. Geier's death it was one of the largest single groups of machine tool plants in the country.

Mr. Geier's activities extended to many lines of business as well as into

educational and civic pursuits. He was one of the leaders in promoting vocational education in Cincinnati and led industrialists of Cincinnati in lending equipment to trade schools. He aided in the establishment of the cooperative engineering system at the University of Cincinnati when he was a trustee and president of the board of the university. He also established a loan fund for cooperative engineering students.

At the time of his death, Mr. Geier was president of the Ohio Mechanics Institute. He was a backer of the Cincinnati Bureau of Governmental Research, and the National Crime Commission and an active worker in the Ohio Valley Improvement Association. He was a member of the American Academy of Political and Social Science, American Institute of Banking, National Municipal League, American Society of Mechanical Engineers, National Society for Promotion of Industrial Education, Chamber of Commerce of the United States, Cincinnati Chamber of Commerce, and numerous other organizations.

Mr. Geier's business interests covered a wide scope of activity. In addition to being president of the Milling Machine company, he was president of the Factory Power Co., the Factory Colony Co., Cincinnati Grinders, Inc., the Cincinnati Rubber Mfg. Co., and the Cincinnati Morris Plan Bank. He was also a director of a number of other companies.

Mr. Geier was an early advocate of the eight-hour day and helped to organize the National Metal Trades Association. In 1910 and 1911 he was president of the National Machine Tool Builders' Association. Last year, he helped to organize the Machinery and Allied Products Institute, the first group of its kind to unify various components of the trade.

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EARL C. BROWN, vice-president of the Mississippi Valley Structural Steel Co. and manager of its St. Louis branch, died at his home in that city on March 27 of heart disease. Mr. Brown was born in Charleston, Ill., and after attending high school there went to the University of Illinois, whence he was graduated in 1907 as an architectural engineer. He at once was employed by the present company's predecessor as a draftsman in the home office in Decatur. He was later made a salesman, manager of the branch in St. Louis, and in 1922 vice-president in charge of the fabricating plant there. He was 49 years old.

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JAMES LYMAN, vice-president of Sargent & Lundy, consulting engineers, Chicago, died March 29 while



EARL C. BROWN

on a visit to Del Monte, Cal. Mr. Lyman received his technical training at Yale and Cornell universities. In 1902 he went to Chicago and was made engineer in charge of the western district of the General Electric Co. He was made a vice-president of Sargent & Lundy in 1911.

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BERT E. THOMPSON, for 17 years associated with the Charles A. Strelinger Co., Detroit, and well known in the southern Michigan machinery trade, died on March 26. For the last year he had been connected with Dodge Brothers Corp.

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GEORGE HARRISON BARBOUR, chairman of the board of the Detroit Michigan Stove Co. and founder of the Michigan Copper & Brass Co., died at his home in Grosse Point Farms, Mich., on March 27 at the age of 91. He became secretary of the Michigan Stove Co. in 1872 and 14 years later was made vice-president and general manager. In 1925 he presided over negotiations which merged this company with the Detroit Michigan Stove Co. From 1913 to 1915 he was president of the Michigan Copper & Brass Co. Known as "the grand old man of Detroit," Mr. Barbour was the first president of the Michigan Manufacturers' Association, the first president of the Detroit Board of Commerce and for two years was a director of the Chamber of Commerce of the United States.

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DR. WALTER ROSENHAIN, fellow and past-president of the Institute of Metals, died at his home at Kingston Hill, Surrey, England, on March 17, aged 58 years. He received his schooling in Melbourne, Australia, where he was graduated in 1897 from the University of Melbourne. He went to England on a research scholarship which enabled him to spend three years at Cambridge. In 1908 Dr. Rosenhain was appointed first superintendent of the department of metallurgy and metallurgical chemistry at the National Physical Laboratory, a post which he held for 23 years and from which he resigned in May, 1931, to take up private practice in London as consulting metallurgist. Dr. Rosenhain was elected a Fellow of the Royal Society in 1913. He was an active member of a number of scientific societies, having been president of the Institute of Metals from 1928 to 1930, president of the International Association for Testing Materials in 1931, and a member of the (British) Iron and Steel Institute.

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JAMES C. CARLTON, since 1926 vice-president and general manager of the Calco Machinery Co., York, Pa., died of apoplexy at the Lankenau Hospital, Philadelphia, on March 14, aged 48 years. He was at one time identified with the Thompson Machinery Co., Pittsburgh, and in 1921 took a

position with the Sherritt & Stoer Machinery Co., Philadelphia, from which he resigned in 1926.

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JOHN KUPFERLE RAITHEL, president and treasurer of the John C. Kupferle Foundry Co., St. Louis, died suddenly there from heart disease. He was 40 years old. A native of St. Louis, he began work at the foundry at the age of 15. He began as a helper in the shop, and later entered the office. He was made president and treasurer nine years ago.

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A. L. MACGREGOR, secretary and assistant auditor Pittsburgh Steamship Co., Cleveland, died suddenly March 27. He had been connected with the company since 1903.

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EDWARD W. JONES, vice-president of the Laclede Stoker Co., St. Louis, died at his home there recently at the age of 45 after a week's illness. He formerly was connected with the Commonwealth Edison Co. and the Laclede-Christy Co.

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ISAAC MOSKOWITZ, scrap iron dealer and philanthropist of Cincinnati, died on March 31, aged 59 years. He had been in the scrap business for 32 years with his brother under the name of Moskowitz Brothers.

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ALTON FARREL, former treasurer of the Farrel-Birmingham Co., Ansonia, Conn., died at his home in New Haven, Conn., on March 28. Shortly after graduating from Yale University in 1902, he became associated with the Farrel Foundry & Machine Co., which was founded by his uncle. In 1912 the company was reorganized under the present name and Mr. Farrel became treasurer. He was born in Ansonia, Aug. 22, 1879.

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KARL E. HUMBERT, for some years with Perin & Marshall in blast furnace and steel plant erection work which took him to India and China, and more recently general superintendent of the Rustless Iron Corp. of America in Baltimore, died suddenly March 29 at Narberth, Pa. He had decided to establish himself in business in California and was en route by automobile, having left New York March 23 to confer on the way with different manufacturing companies likely to be interested in Pacific Coast representation. He was born in Hamilton, Ohio. About 1901 he entered the steel industry with the then new Lackawanna Steel Co. at Buffalo, and about 1903 he went to the Cambria Steel Co., at Johnstown, Pa., where he became estimating engineer. From 1917 to 1930 he was with Perin & Marshall. Mrs. Humbert and John Humbert, a son, who was graduated two years ago from Dartmouth College, survive.

1933-4 Custom House Guide Just Published

THE 1933-34 Edition of the *Custom House Guide* is now off the press. It is edited by John F. Budd, contains 1600 pages and may be obtained from "Custom House Guide," Custom House, N. Y. Price \$10.00. Its contents are grouped under the following headings:

Vol. 1. Port Sections covering all principal ports, each having its own special section.

Vol. 2. General Information — Weights, measures, coins, etc.

Vol. 3. U. S. Customs Tariff Act and Administrative Provisions, including all amendments since the Act was passed.

Vol. 4. Import Commodities alphabetical Index—over 30,000 articles.

Vol. 5. Import Schedule "A" — Classification number and Unit of Quantity for over 30,000 articles.

Vol. 6. U. S. Revenue Act—Manufacturers Excise Tax—Title IV.

Vol. 7. U. S. Customs Regulations Complete including all official changes and amendments to date.

British Researchers To Build Test Cupola

THE British Cast Iron Research Association, which carries on its work from headquarters at Birmingham, has under construction an interesting experimental cupola of 24 in. internal diameter. It is of the balanced blast type and will shortly be erected. The cupola which the association introduced some years ago is now installed at a number of works. There are 37 in operation in the United Kingdom and 13 under construction, the aggregate output being 334 tons an hour.

Resin for Steel Protection

AN improved synthetic resin is reported by the Bakelite Corp. This is said to remain clear and free from skinning when used on metals. It is said to have marked resistance to weathering and to be strongly adherent and protective to steel and other corrodible metals.

More all-steel automobile bodies were shipped by the Edward G. Budd Mfg. Co., Philadelphia, in February and March than in the corresponding months of any year since 1929. Shipments of bodies and body parts totaled 1868 freight carloads, compared with 425 carloads in February and March of last year and 590 carloads in the same months of 1932.



NRA Faces Reorganization

*Greater Code Compliance Desired—Loosening of Capital
Still Sought—Code Price Policies Get Careful Study*

WASHINGTON, April 3. — Pressure upon the capital and consumers' goods industries to reemploy workers has been brought to bear by General Hugh S. Johnson following closely upon the heels of an order from him to W. Averill Harriman to effect a reorganization of the NRA primarily to development of greater code compliance. Though both the capital goods and consumers' goods and service industries have reported that legislative obstacles stand in the way of stimulating employment, General Johnson has proceeded vigorously to have them put more men to work. To this end he has asked for replies by tomorrow to a letter he has addressed to all code authorities in these industries seeking to learn how many men they can reemploy, or to tell the reason why they cannot add to their payrolls. The disbanding of the CWA has speeded up efforts of the NRA.

Realizing objections made to the securities act, stock exchange and banking legislation and the Wagner and Connery labor bills as retarding investment, especially in the heavy industries, a new angle has been taken by the Government in proposing a survey as to possible new investment fields which will attract capital.

Steel Wage Increases Help

The NRA has been given encouragement in its accelerated move to increase purchasing power by the general wage advances in the iron and steel, automobile, and other industries, together with wage increases made by such important concerns as the General Electric Co. To a considerable extent some of these steps meet the proposed 10 per cent wage increase with a like reduction in hours

By L. W. MOFFETT

Resident Washington Editor, The Iron Age

suggested by President Roosevelt at the recent code conference.

Home Rebuilding Program

That the Government proposes to aid in the reemployment program is clear from a proposal of the Administration to institute a large-scale policy of home renovating, building and slum clearance, though there are those who doubt that it will have as great an effect as is hoped on the iron and steel and metal-working industries. Frank C. Walker, director of the National Emergency Council, has said that the Administration will decide soon whether or not it will undertake the nation-wide home modernization plan. He said no definite program has been outlined but that the NEC began a study of it about seven weeks ago. It is understood that it is proposed to tie the plan in with some other activities designed to aid the capital goods industries, where the greatest unemployment exists.

In this latter connection it is said that surveys have been made which prove there are enormous requirements to replace obsolete machinery. This report has not been made public. The question is one of arranging credits. Long term, low interest financing is seen as the need for the capital goods industries, while available financing at present is for short term credits.

The all-important question of financing has developed a number of suggestions, some of which may be

turned to as an attempted solution. One plan is to make direct Government loans to home owners and to building and loan agencies through bills now before Congress to amend the Home Owners' Loan Corp'n. Industries also would be granted credit through industrial loan banks by loans from Federal Reserve banks. It is reported that as much as \$1,500,000,000 has been proposed as a loan reservoir for the tentative home modernization program, but legislation to this end will not take a definite form until the President returns to Washington.

It is this program that gave rise to a report that General Johnson would organize and administer the plan, and that he will be succeeded as NRA administrator by Mr. Harriman, a special assistant to General Johnson, and son of the well-known railroad organizer.

Reorganization Plans Secret

The NRA reorganization and home-modernization programs have been under way for some time but details have been withheld from the public, just as General Johnson has shut down on a great deal of NRA publicity through an order that information must come only from the publicity department. This, of course, excepts the General himself who is just renewing press conferences after a lapse of about a month. These conferences, however, were abandoned partially because of the extreme demands upon General Johnson in connection with a myriad of activities, including labor troubles.

The outstanding purpose of reorganization of NRA is to develop the administrative end and to start a major drive for enforcement of codes.

With this in mind it is reported that a large addition has been made to the NRA legal staff and a litigation division has been established in order to relieve the Department of Justice of the increasing NRA work. Donald Richberg, general counsel of the NRA, will manage the new division, though it will operate under the Department of Justice. A member of the staff, it is said, will be Frank K. Nebeker, assistant attorney general under the Wilson administration, who is expected to take charge of the Weirton Steel Co. case. Legislation necessary to assign Mr. Nebeker has been introduced and was occasioned by the fact that Mr. Nebeker has claims against the Government. Without the necessary legislation this would prevent his taking over the task.

Policy Boards To Be Set Up

Under the NRA reorganization plan, three policy boards will be set up to handle problems of labor, trade practices and organization of code authorities and additionally each of the seven divisional deputies will have assistants for enforcement, code authority organization and administration. The plan has developed the belief in some quarters that for a short time there will be more direct Government control over industry than ever before, but that the plan eventually is to decentralize the NRA and develop greater self-government by industry; or at least, to see if industry will do a greater job of policing itself.

The new assistants will be placed on the policy boards and will turn cases over to the compliance division when necessary, leaving to the latter whether they call for removal of the Blue Eagle or Department of Justice action.

Federal Trade Commission Plans

It is not certain, however, that the Federal Trade Commission won't become an active factor in enforcement of NRA violations. It will if the White House says so. And if it acts in this role it assuredly would be no more incongruous than is the spectacle of industry being organized under codes only to find itself subjected to an inquisition before the National Recovery Board, headed by Clarence Darrow of Chicago. Those who doubt that the procedure of the board is unlike an inquisition should sit in on a "hearing" before this more or less judicial body, apparently designed to tear down what the NRA has done, and yet itself a part of the NRA.

Price Fixing Study

Hardly less conflicting, however, are some of the other moves that follow upon activities undertaken by industry with the sanction of the NRA. An outstanding example is a new price fixing "study." "Studies," "surveys," "drives" have piled upon the country with such tiresome fre-

quency that it must feel it is at the bottom of some sort of scrimmage, political or otherwise.

This particular "study" is going ponderously into the question of relationship of the Government to price fixing. It is being undertaken, so it has been disclosed, by four members of the cabinet. These four members are Secretaries Wallace, Roper and Perkins and Attorney General Cummings. With the Department of Justice in on the study the inference is it has a real snapper in it. It raises the warning sign. Warning against things the NRA told industry were entirely proper. These things used to absorb the attention of the Federal Trade Commission in its busy activities against violations of the anti-trust laws. In this particular "study" the Commission appears to have been pushed into the background, at least for the present. But the commission's report on the steel code raked alleged price fixing fore and aft and this has heightened concern over the distinct contrast in the commission and the NRA policies. Something has to be done to smooth the situation and it apparently is the task of the four cabinet members to do something about it.

The cabinet committee has no fixed plan before it and has not determined upon any preconceived policy. It is said, however, that the committee has given thought to the fact that with production costs rather well known by reason of code provisions, prices might also be determined, perhaps established at minima which industry would be slow to accept voluntarily. The NRA Consumers' Advisory Board, in its attacks on price fixing, launched prior to the Federal Trade Commission foray on the steel code, undoubtedly has been an increasing element of strength in the "drive" against price fixing, no matter how thoroughly justified under the NRA codes.

This study on price fixing was undertaken at a time when General Johnson had before him this identical subject as presented by the distribution and service trade committee of the NRA. This committee was the outgrowth of recent conferences concerning price fixing.

Open Price Policy Gets Attention

The distribution and trade service trade committee reported that the open price principle affords protection to groups of manufacturers against cut throat competition — against chiseling, to again use an overworked word. To this extent the committee held that the open price policy assures maintenance of a fair average wage level—against wage chiseling, which is far more prevalent than is generally realized. The NRA has discovered this to be true and one of the purposes of its enforcement "drive" is to get after this brand of chiselers.

"For the protection of both con-

sumers and distributors, manufacturers operating under open price provisions should be required to file prices on all commodities they produce," the committee report says.

As a means to prevent unjustified hiking of prices, the report said that "the administrator should require members of industry making price advances under open price provisions to produce cost records where it appears that unwarranted price advances have been made."

The report declared further that:

"No effective rule for the purpose of preventing sales below cost can be of benefit to the large majority of retail and wholesale distributors until there is recognition of the principle that base prices must be established which will approximate the invoice or current market cost of the small operators, and that sales below such established bases are treated as unfair competition in violation of the respective codes."

Suggestion was made for individual study of industries, distribution and service trades before further change is made in hours and wages. The suggestion is entirely out of line with the move being made by the Administration for immediate reduction in hours and increase in wages

Coal Industry Submits To 35-hr. Week

WASHINGTON, April 3. — The NRA executive order placing the entire bituminous coal industry under the 7-hr., five-day week, with a \$5 daily basic wage, is expected to be generally adopted despite protests from some mining sections. It is a victory for the United Mine Workers of America, though those operators originally recommending the schedule who represent the vast portion of the Appalachian region expressed entire satisfaction with the new arrangement. They never really opposed the schedule seriously. It means roughly about a 25 per cent increase in labor costs inasmuch as the work-week was cut from 40 to 35 hr. and the basic day rate increased by 40c.

General Johnson, in issuing the executive order, declared an emergency existed; the order was sent out last Friday, on the eve of the expiration of contracts with the United Mine Workers. These contracts would have expired on April 1 in most regions, though in the Illinois and some sections further west they have not as yet expired, and Illinois operators have indicated they may protest and question the legality of the NRA order. The order was made subject to modification at a hearing on April 9.

The question has risen as to whether unexpired wage agreements can be nullified by revision of the bi-

tuminous code as has been done by the executive order. There is much discontent in some sections of the Appalachian region over the increased wage. This is especially true of southern sections, which will now have to pay \$4.60 a day, resulting in an advance of as much as \$1.20 for Alabama mines. Nevertheless, the belief is that all districts will accede to the order, perhaps later with some modification and that labor trouble will be avoided.

National Metal Trades Convention April 25

THE 36th Annual Convention of the National Metal Trades Association will be held at the Waldorf-Astoria, New York, Wednesday and Thursday, April 25 and 26. The convention will be held in New York this year in accordance with the custom of meeting in that city every second year.

Subjects of vital importance to manufacturers and employers will be made the basis of the program. The convention program as outlined now and for which some of the speakers have already been engaged will treat such subjects as "The Extension of Government Supervision of Business", "Legal Aspects of the Labor Relations Section of the N.I.R.A.", "The Monetary Situation", "Industrial Recovery Under NRA", "Experience with Employee Representation", "Social Insurance Legislation", and "Training Skilled Workers for the Future".

Alexander Sellers, William Sellers & Co., Philadelphia; Charles Strawbridge, Goodman Manufacturing Co., Chicago, and N. W. Pickering, Farrel-Birmingham Co., Inc., Ansonia, Conn., have been nominated for election as president, first vice-president, and second vice-president respectively. Harold C. Smith of the Illinois Tool Works, Chicago, has been nominated for election as treasurer.

E. B. Baltzly, Warner Gear Co., Muncie, Ind.; Jacob D. Cox, Jr., Cleveland Twist Drill Co., Cleveland; Harold Falk, The Falk Corp., Milwaukee; D. F. O'Brien, the A. P. Smith Manufacturing Co., East Orange, N. J.; F. H. Payne, Metric Metal Works, Erie, Pa., and A. H. Timmerman, Wagner Electric Co., St. Louis, have been nominated for election to the administrative council to serve for a period of two years.

Japanese consumers, through Mitsui & Co., Ltd., have recently purchased good tonnages of nickel, copper, lead, zinc, and scrap aluminum from American concerns. The high price of steel scrap now prevailing in the domestic market is, however, discouraging Japanese purchases of scrap. Nevertheless it is suspected that there are large stocks of scrap now stored in Japan in view of the heavy purchases of the past two years.

Wagner Bill Would Be Particularly Harmful to Small Industrial Plants

WASHINGTON, April 3.—The harmful effects of the Wagner labor disputes bill upon small industries were thoroughly covered by Roy F. Hall, general counsel, National Lock Co., Rockford, Ill., in a statement last week before the Senate education and labor committee. The company has had considerable experience with the present National Labor Board in connection with employee representation disputes, and Mr. Hall's statement is considered particularly significant. It follows:

1. Small industries located in small communities and employing not over 2000 persons should not be handled in the same manner and subjected to the same treatment as those engaged in mass production, requiring mass labor, such as the coal mines, the steel mills, or even the automobile industry.

Some of the reasons for the above are:

(a) The inability of the small manufacturer to pay the tremendous overhead made necessary.

(b) In a small locality and in a small business, the affairs of a company are more or less public property.

(c) Public sentiment automatically regulates to a very large extent the action of the employer and the employee.

(d) In the present system, the Labor Board seems obsessed with the idea of holding elections—if they can just hold an election they have settled something. These elections cause turmoil and uncertainty, and many times are of no value, and this is nearly always true in small industries.

(e) The expense to the Government of supervising such elections is enormous.

(f) You cannot successfully American Federationize all labor and create in one organization a monopoly without compensating responsibilities. Particularly in small plants.

(g) The expense of unionization must eventually be borne by industry and reach the ultimate consumer.

(h) It would be better to abolish the American Federation of Labor and create a department of Government charged with the administration of the affairs of unionized labor.

2. The American Federation of Labor officials should be removed from all key positions insofar as they affect what ought to be judicial hearings and findings. Some of the reasons for these are:

(a) They assume to speak for labor whereas they represent but a small part of labor.

(b) Those officials are privately

paid by organized labor, yet they are supposed to be serving the public for no compensation. Those supposed to represent other interests on these boards do not have, and do not give, time to the work. The union labor man is there at every turn. It is his very life. He therefore dominates.

(c) It gives them undue influence in trying to Federationize labor.

(d) In the hearings before the present labor board, the union labor officials seldom appear openly, but their fine hand is seen in the acts and decisions of the board.

(e) Take our own case. Mr. Green was a witness on March 15 before this committee. He referred to and condemned the National Lock Co. Yet on March 23 some one purporting to have authority to use the name of the National Labor Board upon which Mr. Green sits sent an 86-word telegram to the National Lock Co. at the Government's expense, notifying it to appear on Tuesday, March 27, at 2.30 p. m., Room 7511, Commerce Building, to show cause why their affairs should not be referred to the Compliance Division of the NRA for the withdrawal of its Blue Eagle, and to the Department of Justice for appropriate action.

3. Men elected to hold office in the legislative branch of the Government, or appointed to the judicial branch, should not sit on commissions of the executive branch. Some of the reasons for this are:

(a) It has a tendency to give more weight to acts of such persons than otherwise would be given.

(b) The object is, or at least the tendency is, to influence them in their acts on the legislative or judicial side.

(c) It tends to confuse the branches of Government, whereas, they were intended to be separate, coordinate branches, not mixed together.

We denied the jurisdiction of the Labor Board in our case from the first instance and sought protection from the courts. Through Mr. Green the board was indicated to have sent a telegram purporting to be signed by Senator Wagner requesting the company to appear before the board in January of this year. Despite the denial of jurisdiction, the company went into some of the features leading up to the walkout which was inspired by a small group of agitators who later practiced intimidation to keep others from work.

On the first day there was present Messrs. duPont and Haas of the Labor Board. Senator Wagner was not present. A young man named Handley took a great part in it although he is not a member of the

Labor Board. After taking a short part of the statement, the board adjourned until the next day. On the next day only Mr. Haas was present, and for as long as a half an hour and three-quarters of an hour at a time he was absent, all during which time Mr. Handley took his place. When Handley went out he called an assistant to somebody, or something.

The National Lock Co. protested

that these shifts were irregular, but was advised that the entire board would read the entire record. The whole proceeding indicated very clearly that the board was there for the purpose of vindicating the other side, and in due time a so-called decision was made. It was signed by Senator Wagner.

We challenge that Senator Wagner ever read the record or any part of

it. It consists of 350 pages, and Senator Wagner did not have time to go over such a record.

In the opinion of the Labor Board the fact that the employees walked out at a time when the company had orders to fill without making previous demands is glossed over as though it were nothing. Trifling things done by the company are magnified and made to stand out as mountains.

Large Part of PWA Allotments for Federal Projects Now in Contract Stage

WASHINGTON, April 3.—More than a billion dollars of the \$1,380,825,370 allotted for Federal projects by the PWA is now in the construction contract stage. The exact figure, as announced by Harold L. Ickes, public works administrator, is \$1,041,310,468, approximately 75 per cent of the Federal allotments. By far the larger portion of this total, \$936,466,490, represents contracts awarded and day labor work started. The remainder is the estimated cost of work now being advertised.

Hundreds of the Federal projects have been completed, more are now under construction and most are now in the stage between the awarding of the contract and the actual starting of the work on the job site, a period devoted to the purchase, fabrication and delivery of materials. It is in this period, according to public works officials, that indirect labor, especially in the heavy industries, derives benefit from Federal purchases. They anticipate that this will prove true in such case as Navy Department contracts, a large proportion of which provide for the purchase of heavy commodities, machinery and equipment.

Work which has been started or finished, contracts awarded or bids advertised by independent agencies such as the Tennessee Valley Authority, the Civilian Conservation Corps or the Civil Works Administration, under PWA allotments from the \$3,300,000,000 fund amounting approximately to another billion dollars, are not included in the total Federal contract figures. While these agencies are operating under PWA allotments and have initiated construction activities resulting in the expenditure of millions of dollars and the employment of millions of men their disbursements and contracts are not under PWA control. The compilation also excludes PWA allotments of something under a billion dollars for non-Federal public works now going into construction.

The figures show that the Navy Department has awarded contracts or started day labor work to the extent of 92 per cent of its total allotments from the PWA. These allotments amounted to \$277,050,924 of which \$254,196,924 is in the contract stage. These contracts, through their time clauses, insure a continuing widespread flow of purchasing power into wages. Of the \$238,000,000 allotted for ship construction, contracts have been awarded or day labor started for more than \$222,000,000.

The allotment of \$7,500,000 to the aeronautics branch of the Navy for aircraft and radio equipment is largely in the contract stage as are other large allotments for machinery, machine tools, handling devices and other equipment. Contracts have been awarded for more than 80 per cent of the \$25,031,872 allotted to the Coast Guard for construction of revenue cutters, patrol boats, cable replacements and other similar purposes. Of the \$255,422,908 allotted to the War Department, Corps of Engineers, for flood control, rivers and harbors and sea coast defenses, \$199,623,359 or 78 per cent is now in the contract stage.

Highway Program Underway

The \$400,000,000 PWA Federal-aid highway program is nearing completion. Reports show that work already under way and completed constitute four-fifths of the program. Latest reports from the United States Bureau of Public Roads showed 825 Federal-aid highway projects completed; 3948 under construction and 5997 awarded for construction. A total of 6742 projects, estimated to cost \$339,637,000, have been advertised for contract or begun by day labor employed directly by State highway authorities.

Road work under construction on March 24 was estimated to cost \$233,477,000 and was given regular direct employment to 121,056 men. Many others were benefiting from indirect

and industrial employment as result of direct expenditures on the roads.

At the request of the city of San Francisco, Public Works Administrator Ickes had reduced a previous loan and grant of \$12,095,000 for extending and improving its water supply system to a loan and grant of \$10,771,000. The \$1,324,000 released by this action has been reallocated to two other San Francisco projects. One of the new projects, which was allotted a grant of \$460,000 is an extension of the city's high pressure fire protection mains in nine districts and construction of 20 underground cisterns to serve as emergency sources of water supply for fire protection in the event of failure of both of the domestic and high pressure systems. The estimated cost of this project is \$2,000,000.

The other project, for which a grant of \$864,000 was allotted, comprises construction of the first units of a new senior high school, a new junior high school, two 18-classroom elementary schools, replacing five obsolete school buildings with new 18-room structures and remodeling and making additions to three old buildings. The total cost of this work is estimated at \$3,069,000.

Missouri Users Protest Steel Code Reopening

TELEGRAMS of protest against the reopening of the steel code were sent this week to Missouri Congressmen and Senators by users of steel in that State. The messages explained that the operation of the code has been very beneficial to the small user instead of harmful, as Senator Borah has stated.

An increase of 81 per cent in railroad shipments of finished automobiles in the second quarter, compared with the same quarter of last year, was forecast at the meeting of the Great Lakes Regional Advisory Board in Toledo, Ohio, on March 28. The number of carloads expected in April, May and June is 100,076, as against 55,236 a year ago.

NRA Reorganization Looks to Further Self-Government in Industry

WASHINGTON, April 3.—Reorganization of the National Recovery Administration took on positive shape with an order by General Hugh S. Johnson which calls for the setting up by all industries under codes of industrial relations committees or boards to adjust labor disputes and appointment of labor and consumer advisers to the administration member or members of code authorities.

Setting up by industries of industrial relations boards is another step looking to self-government by industry and therefore a form of decentralization of NRA. Such boards already exist in several industries, including cotton textile and bituminous coal and are made up of one employer, one employee and a neutral chairman. The new boards are to be established at once.

Advisers for labor and consumer groups are to be chosen by General Johnson from lists submitted by the Labor Advisory Board and the Consumers' Advisory Board. The determination to select these advisers is a partial victory for organized labor which met with opposition when it asked that labor be represented on code authorities. While the advisers are not to be members of the authorities or to attend meeting, except on invitation, they will have free access to the minutes of the meetings. Likewise they will have the right "to appear before the code authority to make statements of specific subjects."

Both moves were forecast by General Johnson in opening the recent general public meetings when he said that with more than 90 per cent of industry and trade now under approved codes, NRA's attention would be devoted to problems of administration and policy.

Information Confidential

Under the order, labor and consumer advisers are required to keep confidential all information concerning the industries to which they are assigned. They will also confine their reports, advice and recommendations and other statements regarding these industries to the administration member of the code authority, the divisional administrator and the appropriate advisory board.

The order calling for the creation of industrial relations committees or board, reads in part as follows:

"All industries operating under approved codes which specifically provide for the creation of agencies for the adjustment of individual labor complaints and labor disputes will immediately set up such agencies as required by the code unless they have already done so.

"All industries operating under approved codes which provide for the creation of an agency to handle labor disputes exclusively will create such an agency immediately, if they have not already done so, and in addition will create an agency to handle labor complaints."

Industries whose codes do not specifically provide for creation of agencies to handle labor disputes and complaints are required to set up boards at once to handle them. Industries with such agencies are required to report immediately to the administrator on the personnel, scope and functioning of the committees or boards.

Other industries in creating boards or committees are to follow the procedure of standards of the NRA's official manual for adjustment of complaints. The manual suggests that the boards of committees should be composed of an equal number of representatives of employers and employees who will choose an additional member to be chairman. The industry members may be appointed by the code authority subject to the disapproval of NRA and "representatives of the employees should be chosen in such manner that all employees in the industry may be represented as fairly as possible."

"Without Vote But With Veto"

The administration member of each code authority will be a member of the board or committee "without vote but with veto, subject to review by NRA and will be responsible to NRA for the proper functioning of the committee." The manual also provides that the boards or committees may set up divisional, regional or local agencies as desired or necessary.

A labor policy board is to be established and "will consider all problems involving the labor provisions of codes and all questions of labor policy," such as hours and wages, differentials, conditions of labor, inconsistencies in codes for similar industries, etc. The board is to consist of a chairman selected by General Johnson and one representative each from the Labor, Industrial, and Consumers' Advisory Boards, and from the Legal and Planning and Research divisions. William Green, president of the American Federation of Labor, has objected to W. A. Harriman, first assistant to General Johnson, who is in charge of reorganization plans. He expressed the opinion that with labor given but one member, handling of disputes would be one-sided and that the new board apparently will conflict with other agencies.

The order gives Mr. Harriman one assistant each for compliance, code

authority authorization and other problems in administering codes. Much broadened authority is given deputy and divisional administrators in order to make speedy rulings, decisions of divisional administrators to be final.

Labor Provisions Must Be Posted

Code authorities have been reminded that under an administrative order of Feb. 28, employers are required to make application to the NRA for official copies of the labor provisions of their codes for conspicuous posting throughout their establishments. The order directed that the applications be filed within 45 days from Feb. 28, in the case of industries which were under approved codes on that date; or from the effective date of the code, or from the date on which an industry becomes subject to a code, whichever is latest.

Under the order, the deadline for industries which were under approved codes on Feb. 28 is April 14.

Coal Code Amended

General Johnson has approved an amendment to the bituminous coal code which, subject to possible modification after a public hearing scheduled for April 9, establishes a 7-hr. work day throughout the industry.

Other Code News

The code for the metal treating industry has been approved, to be effective April 9. It contains a provision by the Administration staying a clause prescribing a waiting period after filing of price lists or terms and conditions, pending a further order.

Hearing will be held April 9 on a code for the refrigeration valves and fittings industry as a supplement to the basic code for fabricated metal products industry.

The Association of Manufacturers of Chilled Car Wheels has submitted for approval changes in its by-laws as required by Administrator Johnson in approving a code of the industry.

A hearing on the proposed modifications to the road machinery manufacturing industry's code will be held by Deputy Administrator George S. Brady, on Thursday, April 12. The amendments, proposed by the code authority, would slightly alter the industry definitions, provide for the formation of subdivisions, permit interpretations of code provisions by the code authority and add certain restrictions to the article relating to unfair trade practices.

General Hugh S. Johnson has ordered the exemption of the members of the copper and brass mill products from the provisions of an executive order that prohibits the Government from purchasing any supplies not produced under the terms of a code. The application for exemption came from the commandant of the Frankford ar-

senal. The case developed out of the calling for bids by the United States Government for materials containing copper to be used by the arsenal. Although the members of the industry are operating under a code, they acquire the materials from producers who have no code and who are not operating under the PRA.

The refractories industry, first group to respond to the President's appeal to American employers to shorten work hours further and to increase purchasing power, has been granted a public hearing by Administrator Johnson on a series of amendments proposed by the industry to make their voluntary action a part of the code for the industry. The hearing will take place at the Raleigh Hotel on April 9.

Following is the complete list of the code authority members for the cast iron pressure pipe industry recognized by the NRA: William B. Byrd, Alabama Pipe Co.; W. D. Moore, American Cast Iron Pipe Co.; R. F. Garcia, Central Foundry Co.; Arthur Roeder, Colorado Fuel & Iron Co.; George Castor, Donaldson Iron Co.; J. D. Capron, Glamorgan Pipe & Foundry Co.; H. E. McWane, Lynchburg Foundry Co.; W. E. Clow, Jr., James B. Clow & Sons; J. D. Sample, McWane Cast Iron Pipe Co.; N. F. S. Russell, U. S. Pipe & Foundry Co.; Leonard Peckitt, Warren Foundry & Pipe Co.; Walter Wood, Florence Pipe Foundry & Machine Co.

Members of this code authority are the members of the board of control of the Cast Iron Pressure Pipe Institute.

R. L. Ahearn of New York has been named to serve as administration member of the code authority of the anti-friction bearing industry. William D. Ward of New York has been appointed to a similar position on the code authority of the horseshoe and allied products manufacturing industry.

Uncommon Metals Gain

SOME of the metals formerly known as rare are now acquiring commercial significance. According to A. D. Little, Inc., Cambridge, Mass., tellurium is being used for toughening sheet lead, and beryllium for hardening copper alloys. Metallic sodium and calcium are used as deoxidizers in the production of several industrial alloys. Oxygen-free copper as well as electrolytically deposited copper is available in thin wide sheets weighing about 1 oz. per sq. ft.

United States Steel Stockholders Are Encouraged—Chairman Sees Crisis Over

STOCKHOLDERS of the United States Steel Corp. were given every opportunity for optimism by their usually conservative board chairman, Myron C. Taylor, at the corporation's annual meeting held in Hoboken, N. J., on April 2. "Last year," he said, "we thought we had turned the corner and could see ahead immediate signs of revival. Today, we know we can."

The benefits of the iron and steel code were also emphasized by Mr. Taylor in answer to a stockholder's question regarding its effects. To date, according to the chairman, the code has been largely beneficial, although he would not commit himself regarding the desirability of continuing the NRA indefinitely. Nor would Mr. Taylor indicate how much of the business improvement of the last year has been attributable to artificial measures. The fact that there has

been improvement, he thought, was sufficient.

Considerable discussion was evoked by the bonus and pension systems of the corporation. It was pointed out that bonuses were not paid unless the company had net earnings of \$100,000,000 or more in any one year, and that officials had consequently not shared in such disbursements since 1930. Mr. Taylor also emphasized the fact that both common and preferred shareholders would be certain to be considered in the future before the payment of bonuses.

The corporation's pension system was thoroughly explained and it was brought out that pensioners had shared with active workers the recent reductions in remuneration, most of which have now been returned, particularly in the case of wage earners and persons in the low-salary class.

NRA To Answer Federal Trade Commission Report on Steel Code

WASHINGTON, April 3.—General Johnson today announced that he will make reply to the report of the Federal Trade Commission on the steel code. He declared that the commission overlooked many facts that the NRA had not been consulted by the commission and that since one bureau of the Government had made a report on the steel code he proposes to make another. The General said he was not satisfied with the steel code by any means, but pointed out that like all other codes it is under observation for the purpose of being improved. He also said that the steel code would not be reopened on account of the commission report.

His announcement was made at a press conference at which it was pointed out that comprehensive plans are being worked out to activate the durable goods industries. These plans, it was stated, are at present in tentative form and are being worked out by the National Emergency Council. He said he realized the absolute necessity of stimulating the durable goods industries in connection with the recovery program. The opinion was expressed, however, that even though the country is on the road to recovery, the producer goods industries must be helped through credit aid.

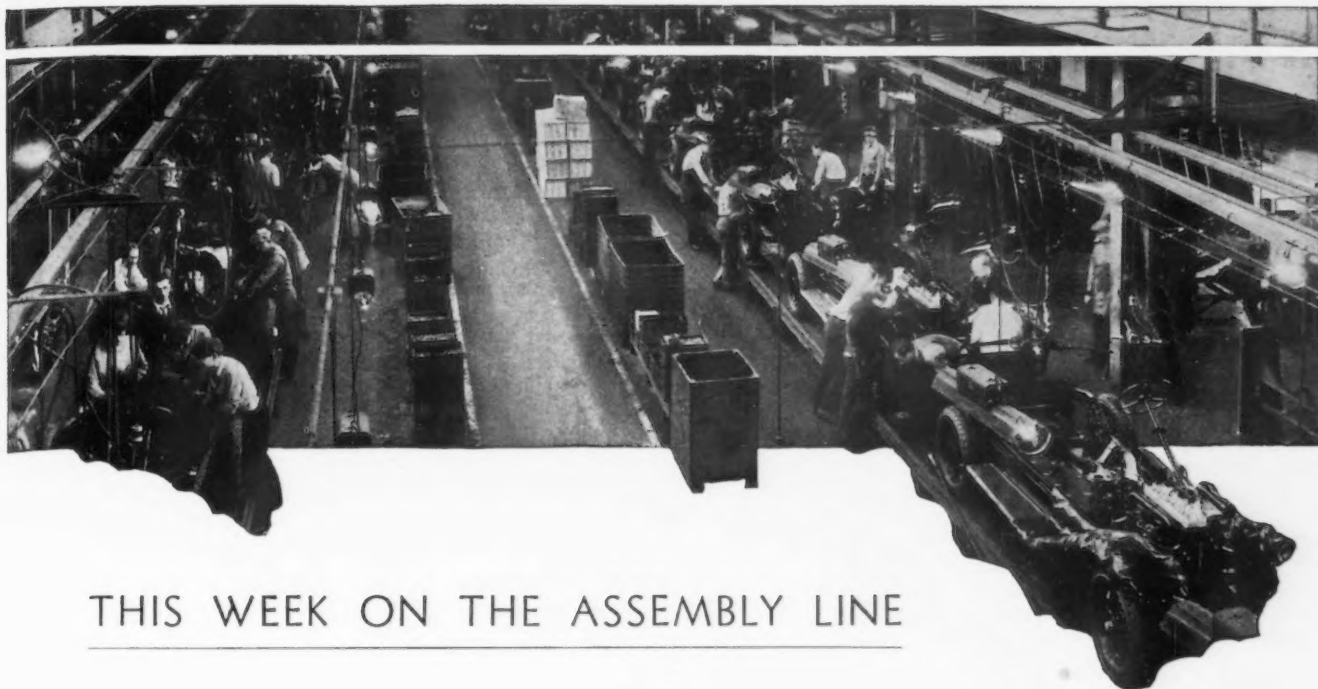
The Administrator indicated that he is much impressed by wage increases that industries have announced and are making and said a study is being made to hear what each industry that has not made wage increases or reduced hours can do in this direction.

On NRA policy he made it clear that it is its purpose to leave to industry greater self government by placing more responsibility on those in industry and less upon the NRA itself, though the latter will continue to keep a check on operations under codes.

It was also stated that A. W. Harri-man has not been put in charge of reorganization plans of the NRA but has offered to serve with the NRA temporarily to assist in revising some of its plans of organization.

American Rolls-Royce Starts V-8 Production

PRODUCTION of the first models of its new line of cars, embodying a modified Ford chassis and V-8 engine and Brewster body, has begun at the East Springfield, Mass. plant of Rolls-Royce of America. Shipments of the new car will begin either near the end of May or the first of June.



THIS WEEK ON THE ASSEMBLY LINE

Automotive Horizon Bright as Crop Bounties Stimulate Retail Sales

DETROIT, APRIL 3.

THE retail automotive horizon has taken on a rosy hue in the eyes of sales executives. With the threat of a strike of production workers definitely dissipated, manufacturers are examining carefully the market which lies ahead and are exceedingly gratified at the prospects.

While retail demand is well sustained in all parts of the country, it is particularly brisk in the South and Southwest. In fact, all of the agricultural areas throughout the nation have shown a greater proportionate gain in sales than industrial centers. Distributors and dealers at Kansas City, for instance, who are serving a large farming district, already have taken as many cars in some cases as in the entire year of 1933.

Unquestionably the money spent for motor cars in rural sections is originating in Government subsidies for the curtailment of crops. Recipients of this cash evidently are spending much of it as fast as they get it.

Dealers Are Not Over-Stocked

Production of automobiles in the immediate future will not be affected by reported purchases by dealers of stocks in excess of current sales in anticipation of a strike. It is true that dealers in many parts of the United States placed orders in February and March for much larger stocks than they normally would because they wanted to have cars to sell in case a strike occurred. However,

their plans were spoiled because factories could not fill these orders much beyond the volume of actual retail sales.

The only division of the industry in which it is intimated that there is basis for the charge of over-production is in motor trucks. Improvement in truck assemblies has been much greater in comparison with last year than the increase in passenger cars. Although some of the gain is attributed to better retail business, in certain quarters it is said that stocking of trucks in anticipation of a strike is partially responsible.

March ended on an optimistic note. Production for the month is estimated to have been about 325,000 units, of which General Motors built 137,000 units, Ford 83,000 and Chrysler 65,000 to 70,000. Chevrolet alone made well over 100,000 units, or almost one-third of the industry's total.

Chevrolet To Set All-Time Production Record

April will bring further expansion of operations. General Motors tentatively has scheduled for all its divisions 165,000 to 170,000 units, with Chevrolet assemblies running as high as 127,000 units. Indications are that Chevrolet will set an all-time high for a single month's output.

Retail deliveries of 1934 models by Chevrolet dealers in the United States in the first 20 days of March amounted to 43,430 units, as against 15,993 in the same period a year ago. Since

the last 10-day period of the month always is the best, it is believed that total domestic deliveries in March were 70,000 to 75,000 units.

Plymouth broke all previous production records last month. Factory shipments from March 1 through March 27 were 39,264 units, assuring a final figure for March of close to 45,000 units. Plymouth likewise established a new retail sales mark the week ended March 24 with deliveries of 7845 units. In the same week production was just under 10,000 units.

Plymouth Forces Are Enthusiastic

The enthusiasm with which the Plymouth organization is imbued these days is best expressed by Harry Moock, general sales manager, when he remarked, "Some companies are looking forward to recovery, some are hailing recovery as having arrived, but the word recovery is totally inadequate as a description of Plymouth's present business outlook."

Since the first of the year Plymouth has booked orders from dealers for 169,287 cars, or over 60 per cent of the number shipped in 1933. It has added a town sedan to its de luxe line.

Dodge has not relaxed its operating rate, having turned out 2623 passenger cars and 1017 trucks in the week ended March 24. The entire Chrysler Corp'n. is geared up to the highest possible rate of production for at least the next 30 days. It is utilizing every available outside source to secure enough stampings, forgings and castings to supplement its own facilities. The portion of the plant of Continental Motors Corp'n. now occupied by Chrysler is now identified as Chrysler's Algonquin plant. There is talk about negotiations whereby Chrysler

will take over the entire Continental factory in order to make more of its own parts.

Chrysler Expands Facilities

It likewise is said that Chrysler has acquired or is about to acquire one or two additional buildings in the immediate vicinity of its Jefferson Avenue works. Now that Chrysler is doing work in the Continental plant, Hudson is in the peculiar position of being almost surrounded by Chrysler.

Pontiac assembled 14,891 cars during March, and since March 19 has been averaging over 700 cars a day. On some days it has pushed operations up to 825 units. For April it has scheduled 18,600 units. Its first quarter production was 43.5 per cent better than in the corresponding quarter of 1933. It has 6511 workers on its payroll, and the Fisher Body plant at Pontiac employed exclusively on Pontiac bodies has 2800 men at work.

In the last month Buick made 6943 cars and has 8746 projected for April. Buick's employment now stands at 14,316 men, with multiple shifts in operation. Buick's payroll in March totaled \$1,725,000.

Machine Tool Outlook Promising

Out of the involved labor situation in the automobile industry the machine tool trade is confident that it will benefit to the extent of a considerable amount of business during the remainder of the year. The Chevrolet Motor Co., heeding the complaints of workers against the group bonus system, is understood to have abolished it. Other companies are said to be considering seriously the abandonment or drastic modification of the system.

What automotive workers are seeking is a straight hourly rate. However, the experience of manufacturers with an hourly rate which has no incentive plan attached to it is that productive efficiency is materially lowered. The men no longer, for instance, have a stimulus to turn out 80 units an hour instead of 60 to 65. A prominent automotive executive is authority for the statement that if a straight hourly rate should become standard practice, it will give impetus to the purchase of automatic machinery which will set a pace for the men so that they cannot lag too much.

Efficiency Is At Low Point

The truth is that the efficiency in automobile plants today is at a very low point. This is attributable to a variety of causes: a considerable number of unskilled help which must be "broken in"; a shortage of skilled workers; the operation of multiple shifts which always brings a lowering of efficiency, particularly on the night shift; and the general restlessness among workers. In addition, individual wage rates are as high as during

boom days. The result is a sharp increase in labor costs with a consequent incentive to replace men with machinery.

These are fundamental reasons why equipment purchases by automobile manufacturers are destined to expand. There are supplementary causes contributing to the situation. Companies which have bought used machinery or have taken idle equipment from warehouses have discovered that costs of doing a particular job have been much higher than anticipated and are in a much more tractable mood to talk about ordering new equipment.

Moreover, there always are weak spots in a production line which must be strengthened. This will be no small factor in stimulating machine tool sales.

Tooling For 1935 May Begin Soon

Generally speaking, this year's production programs are too far advanced to make it likely that large purchases will eventuate in the immediate future. However, the considerations just enumerated will play an important part in determining 1935 plans, which in some cases are not so far distant as one might expect.

A large maker in the medium-price class is developing a tooling program for 1935 models which probably will run as high as \$6,000,000. It is understood that bids may be taken as early as May 1. This company is reported to be contemplating a reversion to its former practice of introducing its cars Aug. 1 or Aug. 15.

Detroit still is buzzing with conversation about prospective new models. Packard is reputed to be preparing to put a light six on the market, although its executives are reticent about the matter. It is said that Packard already has placed orders for dies for this job, but no new sizes of steel have come through.

Chevrolet To Expand Standard Series

Chevrolet will announce on April 14 its standard series, which this year will be expanded to include four models with the business coupe, appealing to the fleet trade, as the leader. The new line will be priced substantially under the master series. A much more aggressive sales drive on this series will be undertaken this year than last. Essentially an economy car, the standard Chevrolet will retain conventional springing. It will be recalled that knee-action wheels cost about \$20 more per car than the traditional front end.

One of the divisions of a leading corporation is reported to be making plans for a light six. This company now is safely entrenched in the \$700 market. It is difficult to figure out where the proposed six would fit into the corporation's merchandising scheme, if the six actually is to be produced in 1935.

A manufacturer in the quality car field is making preliminary plans to tool up for two new motors for next year, one of them at least tentatively to be a rear-engine job.

Plans of the Stout Engineering Laboratories, Dearborn, for a new car, supposedly a radically streamlined, rear-engine car, are now nearing completion, and an official announcement is expected in the near future. William B. Stout, formerly associated with Henry Ford, is the designer of the streamlined Union Pacific passenger train.

Steel Users Seek Contracts

The announcement of increased wages in the steel industry and the anticipation that this will lead to higher steel prices in the near future have brought a flurry of contracting for second quarter requirements by automotive steel users. Many consumers in this district have not been prone to make steel contracts in recent years, but the changed attitude on the part of some companies is shown by the fact that one steel mill catering particularly to the automobile industry has the greatest number of contracts on its books since 1919.

Practically all steel which was held up at the mills when a strike appeared imminent has been released for shipment. While one or two important automobile makers placed considerable steel tonnage the past week, bookings were not substantially higher than the previous week. Flat-rolled steel mills are especially concerned about orders for immediate rolling. They don't expect much improvement during April and probably the first half of May, but if prices advance they look for capacity operations during the final six weeks of the second quarter because of speculative buying on the part of consumers.

It is believed that higher labor costs caused by wage increases will amount to about \$2 a ton so far as sheet finishing mills are concerned. To this figure must be added the step-up in raw and semi-finished steel costs.

Chrysler Corp. has announced increased list prices on all its cars except the DeSoto. The advance is \$35 on the standard Plymouth, \$45 on the de luxe Plymouth and the Dodge six, \$40 to \$55 on the standard Chrysler, \$100 on the Chrysler Airflow and \$130 on the Chrysler Imperial. At the same time Studebaker has marked up list prices \$25 on the Dictator and Commander models and \$50 on the President line. These increased prices are attributed to higher labor and materials costs. Although no official intimation has been given regarding the course which General Motors may take, it is expected that the corporation shortly will follow Chrysler's lead by boosting prices on all its lines. It will be recalled that W. S. Knudsen, executive vice-president of General

Motors, recently predicted that the industry would be compelled to raise prices because of soaring costs.

Whether Ford will go along with the rest of the industry in advancing prices is a moot question. The situation seems to favor retention of present Ford prices. Ford is making a strong drive to return to the industry's leadership and therefore may be expected to use lower prices as a further sales wedge.

Pig iron shipments to the automotive trade in March were about 25 per cent better than in February, and April promises an increase over March. Users, however, still have considerable iron on hand, which was stocked prior to the first of the year, and it probably will be June 1 before it is liquidated. It is believed that pig iron makers will announce a price advance of about \$1 a ton before the end of April.

chinery will be established for determining where a worker's loyalty actually lies when he appears on the membership rolls of both the Federation and a company union.

Obviously the sentiment of workers may change from time to time, thereby affecting the numerical strength of the A. F. of L. and of company unions. It is believed that the board will have to make an annual check-up to see whether the proportional representation in the works council still reflects the union affiliations of workers. The board is expected to function as long as the National Recovery Act is effective, and particularly while Section 7-a remains unchanged.

In general, the board is planning to leave everything possible to voluntary agreement by the interested parties and will issue orders only when necessary. Cases of discrimination against workers, already heard before the Regional Labor Board, are included in the cases to be presented for a final decision to the new board.

Federation to Intensify Activities

The A. F. of L. will redouble its efforts to unionize the automobile industry, despite the setback which it got out of the Presidential settlement. In this respect it must be remembered that the Federation has everything to gain and little to lose at Detroit. It feels that it won at least unofficial recognition when one of its members, Richard Byrd, was selected as the labor representative on the Automobile Labor Board. It likewise claims that it displayed the control it has over its members in the automobile industry when its leaders in Washington at the White House conference sent orders home which were implicitly obeyed.

One should not lose sight of the fact that in the area centering at Detroit the Federation has perhaps the richest labor market in the country to try to organize. It is admitted that the Federation, no matter how little it gains, is not likely to withdraw its activities from the automotive field so long as they are self-liquidating financially.

The industry, on the other hand, is preparing to demonstrate that company unions are all that they are alleged to be as satisfactory media for conducting collective bargaining. These unions will be liberalized to a marked extent and a real effort will be instituted to make them more attractive than membership in the A. F. of L., especially so far as tangible results to workers are concerned.

The entire country, and especially the Roosevelt administration, is expected to keep its eyes focused on the Automobile Labor Board and how effectively it functions. If it is the success hoped for as an agency for industrial peace, it is believed that similar boards will be established in other industries, as hinted in President Roosevelt's settlement.

Board Bans Solicitation By Union Members During Working Hours

DETROIT, April 3.

THAT members of the American Federation of Labor and likewise of company unions may not solicit support for their organizations during working hours was the first order issued at Detroit by the newly-created Automobile Labor Board.

Settlement of the strike at the Nash Motors Co. was among the first problems presented to the board for solution. Charles W. Nash appeared before the board and stated the management's side of the controversy. He was accompanied by E. H. McCarty, president of the Nash company, and H. H. Seaman, president of the Seaman Body Corp., a Nash subsidiary.

L. H. Bentley, president of the Racine, Wis., Auto Workers Union, an A. F. of L. affiliate, was invited to testify on behalf of the strikers, but did not appear. It was unofficially explained that Mr. Bentley did not have authority to represent all the workers and that a committee of 16 men wished to speak on behalf of the strikers, but lacked funds to travel to Detroit. This committee suggested that the board hold a hearing at Kenosha, Wis., where the main offices and plant of the Nash company are located.

Cases of Discrimination Presented

William Collins, organizer at Detroit for the A. F. of L., has presented to the board for its consideration 41 cases of alleged discrimination against union workers in General Motors plants in Flint. Thirteen cases are from the Buick factory, 11 from Chevrolet, 10 from Fisher Body's plant No. 1, and seven from the AC Spark Plug Co. Mr. Collins said that these cases had been hastily prepared so as to give the board something on which to work and that "many, many more will come later." The board will hear complaints from the men themselves, just as do the Regional Labor Boards and the NRA Compliance Boards.

The A. F. of L. is preparing lists of members in General Motors plants

at Flint to submit to the board. Apparently the procedure to be followed is for the Federation to turn the lists over to the chairman of the board, Dr. Leo Wolman. It then will be within the discretion of President Roosevelt as to whether the lists are to be shown to manufacturers. The same rule applies to payrolls to be presented to the board by the companies.

Union membership in Fisher Body's plant No. 1 at Flint is the first list to be supplied the board. Mr. Collins claims that it contains 3800 names out of a total payroll of 4000. He says that this particular list was chosen first because it is representative of the Federation's membership in the automobile industry in six cities.

It is believed, however, that the Federation is putting its strongest lists into the hands of the board first. Admittedly it is better organized in Flint than anywhere else in the industry. It is understood that its paid-up members there are in the neighborhood of 7000 out of a total working force of 43,000.

Plan Needs Interpretation

A close reading of the Presidential agreement ending the strike threat discloses entire paragraphs which need clarification and interpretation. This task will develop upon the Automobile Labor Board. Incidentally, there is no basis for the inference published elsewhere that the automobile industry is surrendering its final decisions on labor matters to a man with labor leanings. Doctor Wolman has the full confidence of the industry as well as of labor and his appointment has been greeted in Detroit and throughout the industry as a particularly happy one.

Personnel of the works councils in various companies to conduct collective bargaining on behalf of employees is to be determined by the board. That is, membership lists of each labor group will be submitted to the board, and supposedly some ma-

Pig Iron Output Up 15.8 Per Cent In March

PRODUCTION of coke pig iron in March totaled 1,619,534 gross tons, compared with 1,263,673 tons in February. The daily output in March, at 52,243 tons, showed a gain of 15.8 per cent over the February daily rate of 45,131 tons. Production for the first quarter of this year was 4,098,433 tons, compared with 1,665,126 tons for the corresponding period last year.

There were 96 furnaces in blast on April 1, making iron at the rate of 53,720 tons a day, compared with 89 furnaces on March 1, operating at the rate of 46,260 tons a day. Nine furnaces were blown in during March and two were blown out or banked, making a net gain of seven furnaces. Independent steel companies put six furnaces in, the Steel Corporation blew one in and took two off blast, and merchant producers blew in two furnaces.

Among the furnaces blown in are the following: One Gary furnace, Illinois Steel Co.; one Lackawanna, and two Cambria, Bethlehem Steel Corp.; one Aliquippa, Jones & Laughlin Steel Corp.; one LaBelle and one Portsmouth, Wheeling Steel Corp.; one Federal, of the Interlake Iron Corp., and the Neville Island furnace of the Davison Coal & Coke Co.

Furnaces blown out or banked included one Carrie furnace of the Carnegie Steel Co., and one Monongahela unit of the National Tube Co.

Daily Average Production of Coke Pig Iron

	Gross Tons			
	1934	1933	1932	1931
January	39,201	18,348	31,380	55,299
February	45,131	19,798	33,251	60,950
March	52,243	17,484	31,201	65,556
April	.....	20,787	28,430	67,317
May	.....	28,621	25,276	64,325
June	.....	42,166	20,935	54,621
1/2 year	.....	24,536	28,412	61,356
July	.....	57,821	18,461	47,201
August	.....	59,142	17,115	41,308
September	.....	50,742	19,753	38,964
October	.....	43,754	20,800	37,848
November	.....	36,174	21,042	36,782
December	.....	38,131	17,615	31,625
Year	.....	36,199	23,733	50,069

Production of Coke Pig Iron and Ferromanganese

	Gross Tons Pig Iron*		Ferromanganese†	
	1934	1933	1934	1933
January	1,215,226	568,785	11,703	8,810
February	1,263,673	554,330	10,818	8,591
March	1,619,534	542,011	17,605	4,783
April	.....	623,618	.....	5,857
May	.....	887,252	.....	5,948
June	.....	1,265,007	.....	13,074
1/2 year	.....	4,441,003	.....	47,063
July	.....	1,792,452	.....	18,661
August	.....	1,833,394	.....	16,953
September	.....	1,522,257	.....	13,339
October	.....	1,356,361	.....	16,943
November	.....	1,085,239	.....	14,524
December	.....	1,182,079	.....	9,369
Year	.....	13,212,785	.....	136,852

*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

	Tons		
	1934	1933	1932
January	7,800	2,602	6,256
February	7,071	2,863	7,251
March	7,197	2,412	7,157
April	.....	1,908	5,287
May	.....	3,129	4,658
June	.....	4,088	6,090
July	.....	6,783	3,329
August	.....	7,756	3,070
September	.....	10,034	3,213
October	.....	8,634	4,286
November	.....	7,639	4,435
December	.....	8,358	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		April 1		March 1	
	March (31 Days)	February (28 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	108,558	75,789	7	3,995	6	3,375
Other New York and Mass.	6,375	6,778	1	205	1	205
Pennsylvania:						
Lehigh Valley	34,326	28,886	3	1,105	3	1,030
Schuylkill Valley	11,029	16,459	1	355	1	350
Susquehanna and Lebanon Valleys	19,040	17,344	1	615	1	620
Ferromanganese	.....	1,430	0	.....	0	.....
Pittsburgh District	270,628	216,317	15	8,655	15	7,695
Ferro and Spiegel	4,136	3,988	1	135	1	140
Shenango Valley	33,019	17,074	2	1,065	2	835
Western Pennsylvania	43,539	23,652	3	1,920	2	845
Ferro. and Spiegel	7,958	.....	1	295	0	.....
Maryland	87,098	61,889	3	2,810	3	2,210
Wheeling District	114,552	80,979	7	3,950	6	3,175
Ohio:						
Mahoning Valley	171,277	145,854	8	5,525	8	5,210
Central and Northern	213,817	175,806	11	6,895	11	6,340
Southern	25,044	21,298	3	925	2	590
Illinois and Indiana	264,280	187,984	13	8,660	11	7,135
Mich. and Minn.	47,828	42,094	3	1,545	3	1,505
Colo., Mo. and Utah	19,269	14,764	2	620	2	525
The South:						
Virginia	.....	.....	0	.....	0	.....
Kentucky	12,741	12,184	1	410	1	435
Alabama	119,509	107,704	9	3,855	9	3,845
Ferromanganese	5,511	5,400	1	180	1	195
Tennessee	.....	.....	0	.....	0	.....
Total	1,619,534	1,263,673	96	53,720	89	46,260

Troy Stack Scheduled To Blow in on May 1

Eastern United States pig iron production will be increased by about 10,000 tons monthly when the Hudson Valley Fuel Corp. at Troy, N. Y., begins operations about May 1. The furnace has been idle for about six years, and will be operated by the newly incorporated Troy Furnace Corp. About 200 men are expected to be put to work at Troy, and the Port Henry, N. Y., mines will benefit as ore will be supplied from that district.

The operating corporation was formed in Delaware, and incorporators were S. O. Hobart, president; John A. Hill of Jackson Heights, L. I.; William H. Jeffers, Forest Hills, L. I.; and Philip D. Ferral, Brooklyn.

American Iron and Steel Institute will hold its forty-third general meeting on Thursday, May 24, at the Hotel Commodore, New York.

SUMMARY OF THIS WEEK'S BUSINESS

General Price Advance Follows 10 Per Cent Wage Increase

Semi-Finished Steel, Sheets, Strips, Wire Products, Plates, Shapes and Bars Are Marked Up—Steel Output Recovers Recent Loss

GENERAL price advances on steel products ranging from \$2 to \$8 a ton have followed the recent 10 per cent increase in wages. While the filing of prices has not been completed, new quotations have been announced on virtually all of the commoner products except pipe, tin plate and rails. On the basis of the advances thus far made public THE IRON AGE composite for finished steel will be raised from 2.028c. to 2.184c. a lb. The advanced figure, however, will still be \$2.26 a ton below the average for 1929 and \$4.50 a ton below that of the popular index base year 1926, notwithstanding that basic wage rates are now back on approximately the same level that prevailed in both 1929 and 1926. A possible advance in pipe may result in a further slight increase in THE IRON AGE composite, and the price of rails may be changed following the expiration of the present quotation on April 15, but no early revision of the tin plate price is looked for.

THE advances have caused widespread contracting for the second quarter, since mills have given their customers an opportunity to cover their needs prior to the effective date of the new prices, which in most cases will not be before April 10. The effect of this anticipatory buying, however, is to rob the industry of the benefit of the advances until the third quarter. In the meantime producers face immediate absorption of higher labor and fuel costs. The only advantage that they can expect to gain from the price changes this quarter is the operating economies that will result from the increased rate of output that will follow the current wave of buying.

EVEN now mills are beginning to feel the effects of the rush of consumers to cover their needs, and sharply higher operating schedules in finishing mills are expected by the middle of the month. The transitional character of the current phase of the steel market is illustrated in production rates in different producing centers. Operations at Cleveland are off seven points to 56 per cent of capacity and output in the South has receded two points to 50 per cent. On the other hand, the Pittsburgh rate has increased three points to 35 per cent and the Valley average two points to 54 per cent. Production in other districts remains unchanged and the national average has risen one-half point to 48½ per cent of capacity.

Pig iron producers have not yet filed price changes, but early advances are regarded as inevitable in view

of the addition of increased fuel costs to higher labor charges. Coal operators have not yet been able to determine the effect of their own new wage set-up, but they have temporarily advanced all grades of bituminous coal 25c. a ton, and both furnace and foundry coke have been marked up 35c. a ton. These changes are effective immediately, since all fuel contracts carry a wage clause.

PIG IRON production in March registered a daily average gain of 15.8 per cent over February. The total for the month was 1,619,534 tons, or a daily rate of 52,243 tons, compared with 1,263,673 tons for February, or 45,131 tons daily. Nine furnaces were blown in during the month and two were put out, a net gain of seven. The net increase in steel works stacks was five, that of merchant units two.

March production of automobiles is estimated at 325,000 cars and April will bring further expansion of operations. General Motors Corp. has a tentative schedule calling for 165,000 to 175,000 units, with Chevrolet assemblies accounting for 127,000. Indications are that Chevrolet will set an all-time high for a single month's output.

MORE railroad steel is reaching mills. The New York Central has placed 38,900 tons of rails, the Erie 32,121 tons, and the Great Northern has tentatively allotted 20,000 tons. Inquiries on which early action is expected include 35,000 tons of rails and 15,000 tons of track accessories for the Baltimore & Ohio, 10,000 tons of rails for the Norfolk & Western, 4200 tons of rails for the Maine Central, and 4250 tons for the Grand Trunk Western.

Structural steel awards, at 8150 tons, are the second lowest for any week this year and compare with 12,250 tons a week ago. New projects of 18,300 tons compare with 10,400 tons last week and 21,400 tons a fortnight ago. Lettings reported in March totaled 84,750 tons compared with 55,225 tons in February and 60,890 tons in January.

Although scrap prices in the pivotal Pittsburgh market show signs of stiffening, there have been no actual advances. Meanwhile, a further decline at Chicago has reduced THE IRON AGE composite for heavy melting steel from \$12.67 to \$12.58 a gross ton. Pending the establishment of the steel prices now being filed, THE IRON AGE composite for finished steel remains unchanged at 2.028c. a lb. The pig iron composite remains unaltered at \$16.90 a gross ton.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:

	Apr. 3, 1934	Mar. 27, 1934	Mar. 6, 1934	Apr. 4, 1933
No. 2 fdy., Philadelphia.....	\$19.26	\$19.26	\$19.26	\$14.34
No. 2, Valley furnace.....	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'ti.....	18.13	18.13	18.13	13.82
No. 2, Birmingham.....	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa.....	18.76	18.76	18.76	14.09
Basic, Valley furnace.....	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh.....	19.76	19.76	19.76	16.89
Malleable, Chicago*.....	17.50	17.50	17.50	15.50
Malleable, Valley.....	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago.....	23.54	23.54	23.54	23.17
Ferromanganese, seab'd car- lots.....	\$5.00	\$5.00	\$5.00	68.00

*This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:

	Cents	Cents	Cents	Cents
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$40.00
Light rails, Pittsburgh.....	32.00	32.00	32.00	30.00
Re-rolling billets, Pittsburgh.....	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh.....	31.00	31.00	31.00	31.00
Wire rods, Pittsburgh.....	36.00	36.00	36.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.....	1.60	1.60	1.60	1.60

Finished Steel

Per Lb.:

	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.75	1.75	1.75	1.60
Bars, Chicago.....	1.80	1.80	1.80	1.70
Bars, Cleveland.....	1.80	1.80	1.80	1.65
Bars, New York.....	2.08	2.08	2.08	1.95
Plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Plates, Chicago.....	1.75	1.75	1.75	1.70
Plates, New York.....	1.98	1.98	1.98	1.598
Structural shapes, P'gh.....	1.70	1.70	1.70	1.60
Structural shapes, Chicago.....	1.75	1.75	1.75	1.70
Structural shapes, New York.....	1.95 1/4	1.95 1/4	1.95 1/4	1.86775
Cold-finished bars, P'gh.....	2.10	2.10	2.10	1.70
Hot-rolled strips, P'gh.....	1.75	1.75	1.75	1.45
Cold-rolled strips, P'gh.....	2.40	2.40	2.40	1.80

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Finished Steel

Per Lb.:

	Apr. 3, 1934	Mar. 27, 1934	Mar. 6, 1934	Apr. 4, 1933
Hot-rolled annealed sheets, No. 24, P'gh.....	2.25	2.25	2.25	2.00
Hot-rolled annealed sheets, No. 24, Chicago dist. mill.....	2.35	2.35	2.35	2.10
Sheets, galv., No. 24, P'gh.....	2.85	2.85	2.85	2.60
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	2.70
Hot-rolled sheets, No. 10, P'gh.....	1.75	1.75	1.75	1.40
Hot-rolled sheets, No. 10, Chicago dist. mill.....	1.85	1.85	1.85	1.50
Wire nails, P'gh.....	2.35	2.35	2.35	1.85
Wire nails, Chicago dist. mill.....	2.40	2.40	2.40	1.90
Plain wire, Pittsburgh.....	2.20	2.20	2.20	2.10
Plain wire, Chicago dist. mill.....	2.25	2.25	2.25	2.15
Barbed wire, galv., P'gh.....	2.85	2.85	2.85	2.35
Barbed wire, galv., Chicago dist. mill.....	2.90	2.90	2.90	2.40
Tin plate, 100 lb. box, P'gh.....	\$5.25	\$5.25	\$5.25	\$4.25

Scrap

Per Gross Ton:

	Cents	Cents	Cents	Cents
Heavy melting steel, P'gh.....	\$14.25	\$14.25	\$14.75	\$9.25
Heavy melting steel, Phila.....	11.75	11.75	12.00	6.75
Heavy melting steel, Ch'go.....	11.75	12.00	12.00	5.25
Carwheels, Chicago.....	11.75	11.75	12.25	9.00
Carwheels, Philadelphia.....	13.00	13.00	12.75	8.50
No. 1 cast, P'gh.....	13.75	13.75	13.75	9.00
No. 1 cast, Philadelphia.....	13.25	13.25	12.50	8.00
No. 1 cast, Ch'go (net ton).....	9.50	9.50	9.50	6.75
No. 1 RR. wrot., Phila.....	11.00	11.00	11.00	7.50
No. 1 RR. wrot., Ch'go (net).....	9.50	9.50	9.50	4.50

Coke, Connellsville

Per Net Ton at Oven:

	Cents	Cents	Cents	Cents
Furnace coke, prompt.....	\$3.85	\$3.50	\$3.50	\$1.75
Foundry coke, prompt.....	4.00	4.25	4.25	2.50

Metals

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Electrolytic copper, refinery.....	7.75	7.75	7.75	4.75
Lake copper, New York.....	8.00	8.00	8.00	5.00
Tin (Straits), New York.....	55.50	54.45	52.62 1/2	24.90
Zinc, East St. Louis.....	4.30	4.32 1/2	4.40	3.00
Zinc, New York.....	4.65	4.67 1/2	4.75	3.37
Lead, St. Louis.....	3.90	3.90	3.90	2.87 1/2
Lead, New York.....	4.00	4.00	4.00	3.00
Antimony (Asiatic), N. Y.....	7.60	7.60	7.30	5.80

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

April 3, 1934
One week ago
One month ago
One year ago

2.028c. a Lb.
2.028c.
2.028c.
1.879

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	LOW
1934.....	2.028c., April 3;	2.028c., Jan. 2
1933.....	2.036c., Oct. 3;	1.867c., Apr. 18
1932.....	1.977c., Oct. 4;	1.926c., Feb. 2
1931.....	2.037c., Jan. 13;	1.945c., Dec. 29
1930.....	2.273c., Jan. 7;	2.018c., Dec. 9
1929.....	2.317c., April 2;	2.273c., Oct. 29
1928.....	2.286c., Dec. 11;	2.217c., July 17
1927.....	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$16.90 a Gross Ton
16.90
16.90
13.68

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
\$16.90, April 3;	\$16.90, Jan. 27	
16.90, Dec. 5;	13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

Steel Scrap

\$12.58 a Gross Ton
12.67
12.92
7.08

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
\$13.00, Mar. 13;	\$11.33, Jan. 2	
12.25, Aug. 8;	6.75, Jan. 3	
8.50, Jan. 12;	6.42, July 5	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 13;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 3	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 11;	13.08, Nov. 22	

Wave of Anticipatory Buying Sets in at Pittsburgh



General Price Advance on Steel Products Will Bring Little Immediate Benefit to Mills — Operations Up; Scrap Stiffens

PITTSBURGH, April 3.—A fairly heavy influx of second quarter steel tonnage has started in anticipation of a general price advance which will embrace practically all steel products, with the exception of tin plate and rails. Since the advances now being filed will not become effective for 10 days, it seems likely that large and small consumers will cover their maximum requirements for second quarter at current price schedules, which represent savings to consumers of \$3 to \$8 a ton under the new base prices.

The general price advances will not result in early profit to steel producers. Steel operators are faced with prompt absorption of higher labor, fuel and other raw material costs. Immediate benefit from the price rise will be limited to the increase in operations that will probably result from the wave of anticipatory buying, which is now apparently under way.

Steel ingot output in the Pittsburgh area this week is up three points to 35 per cent of capacity. Production in the Valleys is slightly higher at 54 per cent. Output in the Wheeling district is maintained at 70 per cent. Sharply higher operating schedules in finishing mills are expected by the middle of April, when rolling against second quarter tonnage will begin. Sheet mills are currently engaged at 55 per cent, and strip mills at 60 per cent. Tin plate operations are holding steadily at 75 to 80 per cent. Wire mills are picking up slightly, but structural and pipe units are still laggards.

Steel scrap has stiffened as a result of a large purchase of No. 1 heavy melting steel in this district. All grades of bituminous coal have been advanced 25c. a ton for prompt shipment. Spot foundry and furnace coke have been advanced 35c. a ton.

Pig Iron

Backlogs at the outset of the second quarter are slim. Foundry activity continues to improve, but the improvement is not yet manifest in orders for pig iron. Non-integrated steel mills are not showing any interest in basic or Bessemer, although some major buying of these grades has long been

expected. Both merchant stacks in this district are now active.

Semi-Finished Steel

Effective April 10, sheet bar prices will be advanced \$4 a gross ton to a basis of \$30, Pittsburgh, Youngstown or Cleveland. Rerolling billets, blooms and slabs will be marked up \$3 a gross ton to \$29, Pittsburgh and Youngstown. Non-integrated mills are actively placing second quarter requirements in anticipation of these price advances. The movement in sheet bars in the past week has been particularly brisk.

Bolts, Nuts and Rivets

Producers are fairly well booked for second quarter. A fair amount of spot business is drifting in, and more frequent releases of railroad business are noticeable. Base discounts are unchanged.

Rails and Track Accessories

The Erie Railroad has placed approximately 32,000 tons of rails and 12,000 tons of companion fastenings. Orders for these products have been widely distributed among producers. The Erie has also ordered 50 cement cars to be constructed by the Greenville Steel Car Co., Greenville, Pa. The Norfolk & Western will open bids today on about 10,000 tons of rails and track accessories.

Bars

With a price advance of \$3 a ton filed on merchant bars, consumers are more generally disposed to cover their forward requirements. Demand has improved in practically every consuming quarter. Automotive tonnage is particularly encouraging.

A further slight pickup in specifications for reinforcing bars is evident. Practically all new work, however, continues to be of Government origin. A warehouse extension in Washington will require a sizeable lot, while other new work is largely unimportant from a standpoint of individual tonnage needs. Private work still is stymied by lack of capital.

Cold-Finished Steel Bars

Specifications from the motor car manufacturers have increased since

the settlement of the strike. Improvement in demand from other consuming sources is also apparent.

Plates and Shapes

Tonnage for railroad car building is increasing. Additional tonnage is in prospect for Government barge construction. Tank work shows no evidence of expanding. Advances of \$3 a ton have been filed by producers for establishment before mid-April.

New structural steel projects increased encouragingly over the past week. Of possible significance is the greater diversification of projects. A county bridge at Georgetown, S. C., will require about 1300 tons. A few small railroad bridges are also in evidence. Awards were also better in the past week. Contract for 2280 tons for State hospital buildings at Pine Air, N. Y., was awarded to McClintic-Marshall Corp. Awards for several small private enterprises were also reported, with State highway bridge lettings comprising the remainder of bookings.

Tubular Products

Mechanical tubing is moving faster to the automotive industry. Specifications for boiler tubes are slightly better. Pipe line projects still are rather scarce, although one or two pipe lines are being tentatively considered. A gas line from central Michigan to Detroit, Flint and Pontiac is planned. The March volume of pipe business matched that for February.

Wire Products

Producers have filed advanced prices to become effective April 10. These include advances of \$3 a ton on plain wire; \$5 on nails, staples and galvanized wire; \$3 on wire fencing, and \$6 on bale ties. Improved specifications for manufacturers' wire from the automotive industry, and a perceptible pickup from miscellaneous consumers indicate some anticipatory covering is already under way. Seasonal expansion in demand from agricultural areas is not yet measuring up to the normal volume this season. Jobbers' stocks are moving very slowly, and there is some question as to whether much speculative buying by the merchant trade can be expected before higher prices are effected.

Sheets

New prices have been filed which advance common grades \$5 a ton on heavy-gage and \$8 a ton on light-gage sheets. The new bases at Pittsburgh are as follows: hot rolled, No. 10, 2c.; hot-rolled annealed, No. 24, 2.65c.; heavy cold-rolled, No. 10, 2.70c.; light cold-rolled, No. 20, 3.15c.; galvanized No. 24, 3.25c. A price of 2.85c., Pittsburgh, or \$4 a ton over the present quotation, has been filed on tin mill black plate. The volume of second quarter coverage in the past few days has been exceptionally heavy, undoubtedly as a result of impending

price advances. Most of this tonnage is widely spread, and the expansion can not be traced to any particular consuming source. Sheet mills have not benefited as yet from the increased volume of business, but schedules within the next two or three weeks will likely be sharply higher. The current average operating rate is held at 55 per cent of capacity.

Tin Plate

Specifications are holding up very satisfactorily. Producers can not forecast at the moment when the current high rate of activity will be interrupted. Independent mills, as a group, are operating nearly at capacity, while the leading producer is engaged at about 80 per cent. The average for the industry is still estimated at about 80 per cent.

Strip Steel

A fairly heavy volume of second quarter contracting is being driven in, probably in expectation of an advance in strip prices. Practically all consuming lines are participating in current business, with automobile tonnage predominating. Producers are filing higher prices to become effective at the close of next week. Strip mills are slightly busier, and this week will probably average 60 per cent of capacity.

Coal and Coke

All grades of coke for spot shipment have been advanced tentatively 35c. a ton. Connellsville furnace coke is thus established at \$3.85, and Connellsville foundry coke at \$4.60, ovens. A tentative increase of 25c. a ton has also been effected on all grades of bituminous coal for prompt shipment. Both coke and coal prices are subject to immediate change. Producers have not yet been able to determine the increased costs accruing from the new wage setup, and advanced fuel prices may be revised either upward or downward when costs become more clearly definable. Practically all fuel contracts carry a wage clause so that producers are covered on commitments entered prior to the recent settlement between producers and miners.

Scrap

A leading consumer has purchased probably around 25,000 tons of No. 1 heavy melting steel, paying \$14.25 for nearby delivery points, and \$14.75 for a plant which usually commands a premium because of a higher freight rate. As a result of this purchase the market for No. 1 steel has stiffened noticeably. Distress offerings which recently hovered over the market are now being absorbed readily, and brokers are not inclined to sell No. 1 steel at less than \$14.50. The prospect of increased open-hearth activity during the second quarter in this district is also a strengthening factor. With the exception of machine shop turnings and short shovel-

The New Prices At a Glance

ACCORDING to the latest information available, advanced prices now being filed with the American Iron and Steel Institute include the following:

	Present New Ad- Price, Price, vance		
	Ton	Ton	per Ton
SEMI-FINISHED STEEL			
Billets, blooms, slabs...	\$26	\$29	\$3
Sheet bars.....	26	30	4
Wire rods.....	36	38	2
	Lb.	Lb.	
Skelp	1.60c.	1.70c.	2
SHEETS			
No. 10 hot-rolled.....	1.75c.	2.00c.	5
No. 24 hot-rolled annealed	2.25c.	2.65c.	8
No. 10 heavy cold-rolled	2.30c.	2.70c.	8
No. 20 light cold-rolled	2.75c.	3.15c.	8
No. 24 galvanized.....	2.85c.	3.25c.	8
No. 28 tin mill black plate	2.65c.	2.85c.	4
STRIP STEEL			
Hot-rolled	1.75c.	2.00c.	5
Cold-rolled	2.40c.	2.80c.	8
WIRE PRODUCTS			
Bright wire.....	2.20c.	2.35c.	3
	Keg	Keg	
Wire nails.....	\$2.35	\$2.60	5
	Per	Per	
	100 Lb.	100 Lb.	
Barbed wire (galv.)....	\$2.85	\$3.10	5
Galv. staples.....	3.30	3.55	5
Polished staples.....	3.05	3.30	5
	Lb.	Lb.	
Bars (billet).....	1.75c.	1.90c.	3
	(tentative)		
Plates	1.70c.	1.85c.	3
	(tentative)		
Shapes	1.70c.	1.85c.	3
	(tentative)		
Rail steel bars (merchant)	1.65c.	1.80c.	3
	Ton	Ton	
Bale ties.....	\$58	\$64	6

These prices are f.o.b. Pittsburgh. Prices at other basing points are in the usual relationship to Pittsburgh.

ing steel turnings, which are quatably lower, the remainder of the list is very steady. The Pennsylvania Railroad tomorrow will close its list, covering 20,700 tons of scrap, including 3400 tons of No. 1 steel. The Baltimore & Ohio list, which will close April 9, covers about 7000 tons, of which 2100 tons is No. 1 steel. Bids on the Pennsylvania Railroad are expected to disclose a minimum delivered price of \$14.50 for heavy melting steel.

Scrap Softens at Detroit

DETROIT, April 3.—With a large amount of scrap coming into the market because of heavy automotive operations and with steel plants giving scrap releases in smaller volume, prices of old material are easier. Hydraulic bundles have dropped 25c. a ton, but still are quoted slightly above heavy melting steel. Excessive stocks

of sheet clippings have resulted in a decline of 75c. in this item. The first boatload of scrap this season will leave Detroit for Cleveland tomorrow, but shipments into Buffalo are likely to be delayed until May 15 by the amount of ice in the harbor there. Dealers are looking for a bulge in scrap in the next 30 days in anticipation of strong steel mill schedules in late May and June.

Pig Iron and Scrap Quiet at Boston

BOSTON, April 3.—Current buying of pig iron is confined to scattered carlots. A Springfield, Mass., foundry inquiring for 100 to 300 tons, so far has bought one carlot. There are no other inquiries. Current talk is of higher prices because of the 10 per cent increase in wages in the iron and steel industry. Connecticut foundries are making a much better showing than those in other New England States. Four of the largest Connecticut melters are operating at 100 per cent of capacity, and smaller plants are averaging 50 to 65 per cent.

With buying by Pittsburgh steel mills at a standstill, and eastern Pennsylvania and New England consumers well covered on requirements, the scrap market is marking time.

Contrary to intimations, the price of by-product foundry coke did not advance on April 1.

"Alloys of Iron and Tungsten," by J. L. Gregg, just published by the McGraw-Hill Book Co., New York, is the third monograph of the Alloys of Iron Research Series. The author located and abstracted almost 1500 research papers, and drew heavily on the advice and opinions of outstanding metallurgists the world over to prepare the manuscript, and the book is undoubtedly a distinctive summary of the present status of iron-tungsten metallurgy. The data not only provide a reliable foundation for further research, but concentrates in one volume information which steel workers, foundrymen and engineers had previously been unable to secure. The author presents the constitution, preparation, and properties of Fe-W alloys, and elaborates fully on the manufacture and characteristics of tungsten steels. A large portion of the book is devoted to tungsten in cast iron and steel, in die steels, and in high-speed steels.

The operating schedule of the steel industry for the week beginning April 2 was 43.3 per cent as compared with 45.7 per cent last week, according to the American Iron and Steel Institute.

Chicago Operations Hold At 47 Per Cent of Capacity



**Trend of Business Uncertain, Though
Favorable Weather Is a Stimulant—Pig
Iron Shipments Show Large Gain—Scrap
Weakens**

CHICAGO, April 3.—Opinion as to the trend in the iron and steel market varies considerably. Some feel that there is a pent-up demand that will break loose before the end of spring, while others are as certain that the crest of the spring movement has been reached. Certain it is that the proposed Wagner bill, now before Congress, is giving the vast majority of manufacturers a bad case of the jitters. It is probably foremost among causes contributing to the current spirit of caution which most employers would like to shake off.

Ingot output remains at 47 per cent of capacity, but the character of operations has altered, fluctuations from day to day being wider than heretofore. The general view is taken that, if ingot output is to climb, the automobile industry must hold steady and railroads must take rails faster and enter the equipment market on a broader basis.

Although more private work is appearing in the building field there is continued dissatisfaction among fabricators, who are bemoaning the fact that their code is not yet in operation and that therefore they have not been accorded expected protection from mill-owned fabricating plants or from independent fabricators out of the Chicago district, who at present find little trouble in reaching into this market.

Weather in the Central West is more of a market factor than usual. Cold weather has come to an abrupt end, thereby aiding outdoor work in construction, track work, pipe laying and scrap gathering. On the other hand, the dry condition of the soil is causing uneasiness in many agricultural areas.

Coke

March prices for foundry coke are being carried forward into April. Quotations for the current month are \$8.50 a ton, local ovens.

Pig Iron

The Northern iron movement in March was fully 40 per cent above February and all indications point to improvement in April. In fact, sellers are at the point of feeling assured that second quarter shipments will show a substantial gain over the first

quarter. Prices are firm at \$17.50 a ton, local furnaces, and both buyers and sellers expect announcements of advances almost momentarily. Melt at agricultural machinery, railroad supply and jobbing foundries is gradually improving.

Cast Iron Pipe

The absence of private work and the slowness with which public work is clearing the hurdles at Washington prevent the market from emerging from the doldrums. Many jobs have been bid on, but final contracts have not been awarded and so pipe sellers must stand by without definite orders. An example of delay of this kind is on 6500 tons of pipe for six towns near Springfield, Ill. Cincinnati is readvertising for a round tonnage, on which bids will be opened April 3.

Reinforcing Bars

Architects' offices are almost bare of work. This means that shops will have to depend almost entirely on jobs financed by public expenditures, most of which are small and slow in maturing. Nash Brothers, Chicago contractors, have withdrawn their bid on Sanitary District work. Illinois continues to let contracts for road work, the practice being to split the work in very small lots. Prices remain steady.

Rails and Track Supplies

Mills have received orders for rails from the New York Central and the Erie, and the Great Northern has tentatively allotted 20,000 tons. The New York Central ordered 38,500 tons, of which 17,450 tons went to Illinois Steel Co., and the remainder to Bethlehem and Carnegie. The Erie orders call for 32,000 tons of rails, and 12,000 tons of track accessories, orders having been taken by Carnegie, Inland, Illinois and Bethlehem. Only a few small scattered lots of rails remain to be purchased in accordance with the buying program made last fall. Sellers expect some additional purchases to be made before the end of spring but point to the fact that the present price was extended only to April 15. Operations at local rail mills are steady, but increased demand, resulting from open weather, is expected to speed up shipments by mid-April. Accessory business is active, not only because of PWA money, but

also on account of the seasonal increase in consumption for general maintenance work.

Bars

Specifications for bar mill products are steady, a moderate drop in releases from automobile centers having been balanced by better demand from small and miscellaneous shops. The change in automobile specifications may be significant as an indicator of the trend in that industry, but mills are not quite convinced that the week's developments are conclusive, though few will deny that possibly the peak of motor car production has been reached.

Sheet Bars

Illinois Steel Co. has filed new prices and other mills are expected to follow suit. The new prices are up \$4 a ton to \$30, Chicago.

Billets

Illinois Steel Co. is advancing billets \$3 a ton, the new prices now being on file to become effective April 10.

Plates

From all indications railroad work must be depended upon to come to the rescue of this market. Only an occasional lot of brewery work is coming out for figures and business is very quiet in the oil country, as gaged by activity in Chicago plate shops. It is understood here that most of the materials for the Van Sweringen cars have been ordered. Chicago mills are now turning their attention to the cars that the Chicago Great Western plans to build.

Structural Material

This market is dull, though it is significant that three fair-sized tonnages have been placed this week in Chicago for private enterprises. The addition to the Davis store, which a week ago was shelved because bids were too high, has been awarded, thereby indicating that agreement was finally reached between buyer and seller. Illinois is taking bids on 18 bridges, which will require 5200 tons of steel.

Wire Products

All indications point to higher prices for wire products, as some sellers have already filed advances of \$3 to \$5 a ton. Contracting has been active, with the result that second quarter books have grown materially heavier in the last week. Reports from agricultural sections vary. Subsoil moisture is lacking in many areas and unseasonable weather has put planting back as much as three weeks in a large part of the nearth Southwest.

Scrap

Although sales are lacking, heavy melting steel is quotable at 25c. a ton lower, with \$12 at the top. Supplies of most grades are ample and there is rather a heavy swing of scrap from the Southwest to Chicago.

Price Advances Stimulate Contracting at New York



**Increases Range from \$2 to \$8 a Ton—
Widespread Consumer Covering Will
Postpone Their Effectiveness Till Next
Quarter**

NEW YORK, April 3.—General advances in steel prices for the second quarter have caused widespread covering at previously existing prices. The new quotations, which in most cases were filed today, will not become effective for 10 days. Thus most buyers will escape the effect of higher prices until the third quarter.

Railroad buying is accounting for the larger share of current mill bookings. The New York Central has placed 38,900 tons of rails together with several thousand tons of fastenings, and the Erie has distributed orders for 32,121 tons of rails and 12,000 tons of fastenings. The Baltimore & Ohio will close possibly this week for 35,000 tons of rails and 15,000 tons of fastenings, and the Norfolk & Western will take bids April 13 on 10,000 tons of rails. The Lehigh Valley has ordered five locomotives from the Baldwin Locomotive Works. American locomotive builders are figuring on an inquiry from South Africa for 50 engines.

The Navy bill just passed by Congress calls for the construction during the next fiscal year of four cruisers, 12 destroyers and six submarines.

Delay at Albany in the passage of the New York City economy bill is not only holding up accumulated payments due to contractors and subcontractors who have completed city work, but is also delaying action on municipal building projects for which Government loans have been authorized.

The plans for the Triborough bridge have been revised so as to reduce the size of the structure. The steel requirements of the two towers have been cut down about 1000 tons each, and reduction in the width of the span will lop off another 8000 or 10,000 tons. The total requirements of the bridge are now estimated at about 45,000 to 50,000 tons. Revision in the plans will delay action on the remaining contracts for possibly six months.

Pig Iron

An inspection of foundry activity in this district has disclosed little change in melting volume from previous weeks. Nevertheless, aggregate sales continue at a comparatively high level, and furnaces estimate that total

March shipments will equal any month during the past year. One seller disposed of a good tonnage of specialty iron last week, and complete bookings amounted to 5100 tons, against 4300 tons in the previous period, and 2500 tons sold two weeks ago. The current buying wave is made up of miscellaneous modest parcels for prompt and second quarter deliveries, and the heightened interest is a result of a general desire for protection from possible price advances. The newly organized Troy Furnace Corp. expects to blow in the long idle Hudson Valley Fuel Corp.'s stack at Troy, N. Y., on May 1. It is reported that the corporation has already procured a fair backlog. In addition, a Buffalo furnace is also expected to go into blast in the near future.

Reinforcing Steel

There is a good flow of small orders, but sellers in this territory are still

Scrap Advances on Pacific Coast

SAN FRANCISCO, April 2.—Improvement in Pacific Coast business is reflected in the increased domestic demand for scrap, which recently advanced \$1 per gross ton. March purchases, which are for direct consumption, are the first in many months and far exceed those of the same period in 1933. Pig iron production has increased correspondingly. Due to price differentials which have favored Coast yards over those of Eastern and Gulf States the export of scrap to the Orient has been heavier, with better offers being made than by domestic consumers.

Sheets are reported fairly active, with a good gain over the fourth quarter in 1933. Reinforcing bar awards, while fewer in number, have increased in volume due to highway work. Structural steel and plate movement is less active, although major projects are in the offing. Wire products have made steady gains in sales and have not suffered so keenly of late from foreign competition. The decrease in imports of foreign steel

dependent on highway work in nearby States for occasional tonnage awards. Higher distributors' quotations on reinforcing bars are considered certain in view of a \$3 a ton advance in the mill price which has been filed with the steel institute. Carnegie Steel Co. has been awarded 1500 tons of floor beams and 850 tons of bars for use in the midtown tunnel, New York, and Oliver Iron & Steel Corp. will supply 1300 tons of rods for the same project. Additional awards of 400 tons of highway mesh for Pennsylvania and New Jersey contractors have been secured by American Steel & Wire Co.

Scrap

This buying market is only moderately active, and prices on a number of less important grades are somewhat uncertain in the absence of demand. Brokers are a little hesitant, and are awaiting possible reactions to price advances being announced by steel mills. Bethlehem continues to purchase steel on barge, and several accumulations of turnings and stove plate have been shipped to Phoenixville, Pa. One broker recently bought steel car axles at \$10.75 and \$11.50 a ton for rail and barge loading respectively, and good tonnages of steel have been collected for delivery to the wire mill at Trenton, N. J., and the consumer at Conshohocken, Pa. Exporters booked a moderate number of new orders last week, and shipments against previously reported sales are steadily going forward from Eastern, Pacific and Gulf ports.

is believed to be due both to unfavorable rates of foreign exchange and preference for domestic steel. Purchase of rails and track accessories is practically nil, with little business being anticipated before fall. Cast iron pipe awards have been limited, but heavy tonnages are included in projects for which bonds have been voted.

Among the new projects reported during the week the boiler plant for Boulder dam, requiring 5000 tons of structural steel, was outstanding. Specifications for a reservoir outlet at Monte Vista, Colo., call for approximately 2000 tons of plates, while the Metropolitan Water District at Los Angeles will take bids on 2500 tons of liner plates and tunnel supports. Plans are being completed and bids are to be taken soon on the Grand Coulee dam and power plant, which will require a minimum of 9000 tons of steel. Awards reported during the week were limited, with no major tonnage being placed.

Interlake Steamship Co., Cleveland, had net profit of \$446,337 during 1933 as compared with a net loss of \$317,770 in 1932. Profit before depreciation and Federal income tax amounted to \$1,050,329.

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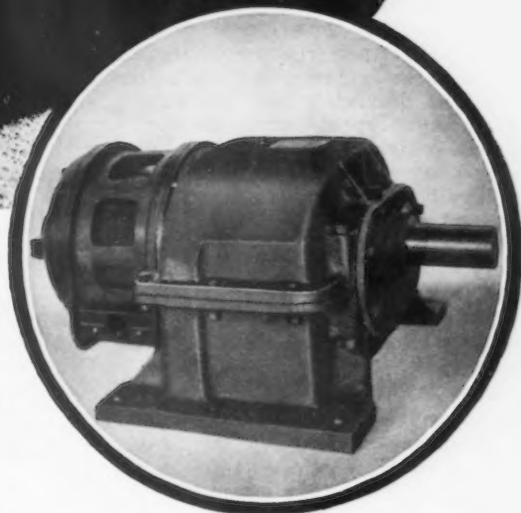
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Price Rise Drives in Business at Cleveland



Forward Covering in Both Steel and Pig Iron—Wages of Iron Miners Are Advanced 10 Per Cent

CLEVELAND, April 3.—Price advances on practically all steel products are being filed on account of the increase in production costs caused by the 10 per cent wage advance which was put in effect April 1. Pig iron prices also probably will be marked up because of the higher production costs due to both the wage advance and an increase in fuel prices.

Consumers not previously under contract, spurred by the expectation of higher prices, rushed into the market during the week and covered for the second quarter. While some of the mills have not actively solicited contracts, they have made commitments with their regular customers. Some of the automobile manufacturers who previously had covered for their April requirements have now placed contracts for the remainder of the quarter. With consumers quite generally protected with contracts at present prices for the remainder of the quarter, mills will be benefited very little by the price advance until the third quarter. Hence it will be three months before they will be able to pass along to consumers the increase in production costs due to higher wages.

Iron miners in the Lake Superior district have been given the 10 per cent wage increase, and this has led to a possibility of an advance in ore prices, which is being considered by ore firms this week. However, miners' wages are still slightly below the scale paid when present ore prices were established in 1929.

The Erie railroad has purchased 29,987 tons of rails exclusive of seconds, and 12,000 tons of track fastenings.

Ingot output in the Cleveland-Lorain territory has again declined, being 56 per cent of capacity this week, a reduction of seven points. One local producer took off three open-hearth furnaces. Another Cleveland plant has deferred the blowing in of a blast furnace that was scheduled to start up early this month.

Pig Iron

A price advance is expected shortly as costs have been increased by the 10 per cent wage advance, which has been applied to merchant blast fur-

nace plants, and fuel costs will rise with the new wage scales in the bituminous coal mines. The probability of higher prices has caused a sharp increase in sales. A leading Lake furnace interest sold 10,000 tons during the week as compared with 6000 tons the previous week. Considerable additional business is still pending. Shipments continue good, and most of the iron contracted for the first quarter has been taken out by consumers. However, some foundries, largely jobbing plants, that have not been affected by the activity in the automotive field, are still carrying considerable low priced iron that they took in late during December. It is not believed that many furnaces will have any of this iron left after May 1. Purchases by the General Motors Corp. are not expected for some time, as it is believed that the stock put in last fall at Saginaw by that company will not be used up before July.

Sheets

Impending price advances caused a considerable number of the automobile plants in the Michigan territory to place contracts for the balance of

Demand More Active At Buffalo

BUFFALO, April 3.—Inquiry has picked up in pig iron. Two or three foundry lots, to be placed shortly in the East, total 700 tons. These are for shipment between now and July. The Tonawanda Iron Corp. will probably keep its furnace in operation but may switch over from foundry to malleable. An unverified report current here is that the stack of the Perry Iron Co., Erie, Pa., may be blown in shortly.

Operations of most Buffalo mills are continuing on the same scale as last week. Gould Coupler Works has two 25-ton basic open-hearth furnaces active. This represents 50 per cent operation. A local fabricator has contracts for 140 tons of structural steel for the factory of the Heinz Pickle Co., Medina, N. Y., and for 100 tons for a plant of the Canadian Wineries, Ltd., to be located at Lewiston, N. Y.

the second quarter. Heretofore orders from this source have been largely for April requirements. Demand in this territory is quite active. While most of the tonnage is going to stamping plants making automobile parts, the stove industry is now furnishing a good tonnage and liberal releases continue to come from refrigerator plants. Some toy manufacturers have got very busy. Steel barrel business is not very active.

Strip

Consumers are getting under cover with second quarter contracts. A steady volume of business is coming from the automotive industry in releases, but current orders show some falling off.

Bars, Plates and Shapes

Orders for merchant bars continue fairly heavy, with most of the demand from the automotive field. Alloy steel bars are also very active. Demand for steel in the construction field continues light. A new list of Ohio highway projects calls for only a small tonnage of reinforcing bars. Inquiry for plates from boiler shops has improved, but business is slow in being placed.

Scrap

Scrap is moving a little more freely. Cleveland consumers are taking shipments, one accepting blast furnace scrap only, and several Youngstown district mills that entirely held up deliveries about two weeks ago are now taking shipments in restricted quantities. New consumer demand is lacking. Dealers are paying \$9.50 for blast furnace scrap for Cleveland delivery. New automobile offerings, including large Chevrolet and Buick lists covering April production, will be closed this week.

The State of New York is accepting bids on a 100-ton structural job, a coal trestle at the Gowanda State hospital. Important rail awards, viz., 15,000 tons for the Boston & Maine, 15,000 tons for the Erie and 15,000 tons for the New York Central have been made to the Bethlehem Steel Corp. for rolling at Lackawanna. Award of 350 tons of reinforcing bars for an addition to the plant of the Beechnut Packing Co., Rochester, N. Y., has been made.

After extensive purchasing of No. 1 and No. 2 heavy melting steel over the past week, the principal district consumer has dropped its price to \$12.50 and \$11 for the two grades. It is stated that some comparatively small tonnages were purchased out of town at these prices. Scrap is coming out more freely and, if navigation opens at the usual time, boat tonnages may arrive before it becomes necessary to again make extensive purchases. One interest is said to have 75,000 tons on boat at Detroit.

Second Quarter Buying Lags in South

BIRMINGHAM, April 3.—As the second quarter begins, there is an absence of anything like a definite movement in pig iron buying. Melters are buying conservatively, keeping close to current requirements and confident they will have sufficient time to cover if there should be a price advance. There has been a gradual accumulation of second quarter tonnage for several weeks but orders have been mostly small. March shipments of all three merchant producers were larger than those of February. The base price continues at \$13.50. Furnace operations are unchanged, with ten stacks active.

Stove plant operations continue at a good level, and afford pig iron one of its best outlets. March business of the cast-iron pipe plants was about the same as in February, the last two weeks offsetting a poor showing during the first half. Birmingham plants expect a release this week on about 3500 tons of pipe awarded several weeks ago by San Juan, Porto Rico.

Steel

Steel buyers have been somewhat hesitant about making second quarter contracts, and business booked thus far has not been up to the customary levels. There is a fair demand for wire products, but sheets, bars, plates and shapes are slack. Several small orders were received last week for rail material, the aggregate tonnage being good. Better demand is expected to follow impending price advances.

Twelve open-hearths were active last week and the same schedule is planned for this week.

Business at Cincinnati In Unchanged Volume

CINCINNATI, April 3.—Melters have become increasingly cautious, holding pig iron purchases down to actual needs. Automotive foundries, while low on material, refuse to order for second quarter until castings releases are received. Buying resistance refuses to yield to assurances of price increases or to prospects of early improvement in business following the settlement of labor disputes in Detroit. Second quarter books of furnace interests are noticeably lacking in substantial business. A Northern furnace has sold 250 tons of foundry iron to a northern Indiana consumer. The week's bookings totaled 600 tons.

Coke

Despite the easing of the melt, shipments of foundry coke are being well sustained. Prices are steady at

recently announced levels, with relatively no buying beyond 30-day periods.

Scrap

Mill interest in scrap purchases is lagging, giving the market undertone further softness. Dealers are holding available material for price advances and are not taking in scrap except at a price. Automobile lists, just offered, are the heaviest in recent years.

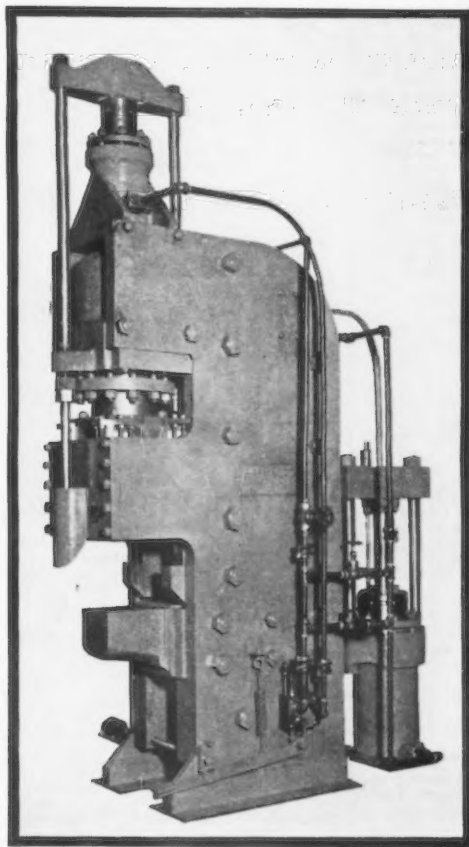
Steel

Easing of automotive sheet demand is offset by increased business from

household appliance manufacturers. Automobile buying, however, is at an encouraging level, but not equal to that of a month ago. Rolling schedules of 60 per cent of mill capacity are justified by the level of new business. April books are fairly well filled, but little or no business has yet been booked for May.

In THE IRON AGE of March 29, page 41-D, the word "sheets" instead of "shapes" was inadvertently used in referring to bids to be opened April 6 by the Bureau of Supplies and Accounts, Navy Department.

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BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh mill	1.75c
F.o.b. Chicago or Gary	1.80c
Del'd Philadelphia	2.04c
Del'd New York	2.08c
F.o.b. Cleveland	1.80c
Del'd Detroit	1.90c
F.o.b. Buffalo	1.85c
F.o.b. Birmingham	1.90c
F.o.b. cars dock Pacific ports	2.30c
F.o.b. cars Gulf ports	2.15c

Roll Steel

(For merchant trade)	
F.o.b. Cleveland	1.70c
F.o.b. Chicago	1.70c
F.o.b. Gary	1.70c
F.o.b. Pittsburgh	1.65c
F.o.b. Buffalo	1.75c
F.o.b. Birmingham	1.80c

Bullet Steel Reinforcing

(Cut lengths as quoted by distributors)	
F.o.b. P'gh mills	1.90c
F.o.b. Birmingham	1.95c
F.o.b. Buffalo	1.95c
F.o.b. Cleveland	1.95c
Del'd Detroit	2.05c
F.o.b. Youngstown	1.95c
F.o.b. cars dock Pacific ports	2.35c
F.o.b. cars dock Gulf ports	2.30c
F.o.b. Chicago	1.95c

Roll Steel Reinforcing

(Cut lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.75c
F.o.b. Cleveland	1.80c
F.o.b. Chicago	1.80c

Common Iron, f.o.b. Terre Haute, Ind.	1.60c to 1.75c
Refined iron, f.o.b. P'gh mills	2.75c
Common iron, del'd Philadelphia	1.80c
Common iron del'd New York	1.90c

Steel Car Axles

F.o.b. Pittsburgh	2.50c
F.o.b. Chicago	2.50c

Tank Plates

Base per Lb.	
F.o.b. Pittsburgh mill	1.70c
F.o.b. Chicago	1.75c
F.o.b. Gary	1.75c
F.o.b. Birmingham	1.85c
Del'd Cleveland	1.85c
Del'd Philadelphia	1.85c
F.o.b. Coatesville	1.80c
F.o.b. Sparrows Point	1.80c
Del'd New York	1.90c
F.o.b. dock cars Pacific ports	2.25c
F.o.b. cars dock Gulf ports	2.10c
Wrought iron plates, f.o.b. P'gh	3.00c

Floor Plates

F.o.b. Pittsburgh	3.20c
F.o.b. Chicago	3.25c

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh mill	1.70c
F.o.b. Chicago	1.75c
F.o.b. Birmingham	1.85c
F.o.b. Buffalo	1.80c
F.o.b. Bethlehem	1.80c
Del'd Philadelphia	1.85c
Del'd New York	1.90c
F.o.b. cars dock Pacific ports (stand)	2.10c
F.o.b. dock cars Pacific ports (wide flange)	2.25c
F.o.b. dock cars Pacific ports (wide flange)	2.35c

Steel Sheet Piling

Base per Lb.	
F.o.b. Pittsburgh	2.00c
F.o.b. Chicago mill	2.10c
F.o.b. Buffalo	2.10c
F.o.b. cars dock Gulf ports	2.45c
F.o.b. cars dock Pacific ports	2.45c

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.	
Open-hearth grade, base, 2.45c a lb. except at Bethlehem where the price is 2.55c.	
Delivered price at Detroit is 2.60c.	

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	\$0.25
2100 (2¼% Nickel)	0.35
2300 (3¼% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c higher. The differential for cold-drawn bars is ½c per

lb. higher with separate extras. Blooms, billets and slabs under 4½ in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4½ in. to 10½ in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Cold Finished Bars *

Base per Lb.	
Bars, f.o.b. Pittsburgh mill	2.10c
Bars, f.o.b. Chicago	2.15c
Bars, Cleveland	2.15c
Bars, Buffalo	2.20c
Bars, Detroit	2.30c
Bars, eastern Michigan	2.35c
Shafting, ground, f.o.b. mill,	
1-3/16 to 1½ in.	3.40c
1-9/16 to 1¾ in.	2.75c
1-15/16 to 2½ in.	2.60c
2-15/16 to 6 in.	2.45c

* In quantities of 10,000 to 19,000 lb.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Hot Rolled

Base per Lb.	
No. 10, f.o.b. Pittsburgh	1.75c
No. 10, f.o.b. Gary	1.85c
No. 10, del'd Detroit	1.85c
No. 10, del'd Phila.	2.15c
No. 10, f.o.b. Birmingham	1.90c
No. 10, f.o.b. dock cars Pacific ports	2.42½c

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.25c
No. 24, f.o.b. Gary	2.35c
No. 24, del'd Detroit	2.45c
No. 24, del'd Phila.	2.54c
No. 24, f.o.b. Birmingham	2.40c
No. 24, f.o.b. dock cars Pacific ports	2.95c
No. 24, wrought iron, Pittsburgh	4.30c

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.30c
No. 10 gage, f.o.b. Gary	2.40c
No. 10 gage, del'd Detroit	2.50c
No. 10 gage, del'd Phila.	2.59c
No. 10 gage, f.o.b. dock cars Pacific ports	3.00c

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.75c
No. 20 gage, f.o.b. Gary	2.85c
No. 20 gage, del'd Detroit	2.95c
No. 20 gage, del'd Phila.	3.04c
No. 20 gage, f.o.b. dock cars Pacific ports	3.45c

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.85c
No. 24, f.o.b. Gary	2.95c
No. 24, del'd Phila.	3.14c
No. 24, f.o.b. Birmingham	3.00c
No. 24, f.o.b. dock cars Pacific ports	3.55c
No. 24 Wrought iron from Pittsburgh	4.95c

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.25c
No. 20, f.o.b. Pittsburgh	2.90c

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.65c
No. 28, Gary	2.75c

Tin Plate

Base per Box	
Standard cokes, f.o.b. P'gh district mill	\$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

Base per Lb.	
All widths up to 24 in., P'gh	1.75c
All widths up to 24 in., Chicago	1.85c
All widths up to 24 in., del'd Detroit	1.95c
Cooperage stock, Pittsburgh	1.85c
Cooperage stock, Chicago	1.95c

Cold-Rolled Strips

F.o.b. Pittsburgh	2.40c
F.o.b. Cleveland	2.40c
Del'd Chicago	2.68c
F.o.b. Worcester	2.60c

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland.)	
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To Manufacturing Trade Per Lb.	
Bright wire	2.20c
Spring wire	3.20c

To Jobbing Trade

Extras of 10c. a 100 lb. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. An allowance of \$2 a ton is made to jobbers on straight, mixed or joint carloads; \$3 a ton is allowed on less-than-carload shipments.

Standard wire nails

Smooth coated nails	\$2.35
Galvanized nails:	

15 gage and coarser	4.35
16 gage and finer	4.85

Base per 100 Lb.

Smooth annealed wire	\$2.35
Smooth galvanized wire	2.70
Polished staples	3.05
Galvanized staples	3.30
Barbed wire, galvanized	2.85
Woven wire fence, base column	60.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Inches	Black Galv.	Inches	Wrought Iron
1/4	51½	2 1/2	+91½ +138
3/8	57	3	+11½ +21½
1/2	62	3 1/2	+31½ 15
5/8	65½	4	+36½ 20½
1 to 3	67½	4 1/2	+39½ 25½

Lap Weld

2	63½	5 1/2	37	22½
2 1/2	66½	6	34	25
3	68½	6 1/2	4 to 8	40 28½
3 1/2	67½	7	38	24½
4	67	7 1/2	38	24½
4 1/2	66	8	38	24½

Butt Weld, extra strong, plain ends

1/4	48½	3 1/2	+13 +45½
3/8	54½	4	+2½ +34½
1/2	59	4 1/2	+32½ 17½
5/8	61½	5	+43½ 28
1 to 3	66½	5 1/2	+43½ 29

Lap Weld, extra strong, plain ends

2	61½	5 1/2	40	26
2 1/2	61½	6	4 to 4 1/2	33
3	69	6 1/2	4 to 6 1/2	32½
3 1/2	68	7	4 to 8	46 33
4	67	7 1/2	9 to 12	41½ 30
4 1/2	66	8	11 and 12	66 56

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	Charcoal Iron
2 in. and 2 1/4	1 1/2 in.—1 3/4 in. 44
3 in.	2 in.—2 1/4 in. 13
3 1/2 in.—2 1/2 in. 40	2 1/2 in.—2 3/4 in. 16
3 in.	3 in.—3 1/2 in. 17
3 1/2 in.—3 1/2 in. 47	3 1/2 in. to 3 1/2 in. 18
4 in.	4 in. to 4 in. 20
4 1/2 in. to 6 in. 42	4 1/2 in. to 4 1/2 in. 21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap welded steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload 4 points under base and two fives. Charcoal iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five. Exception: On 1½ to 1¾-in. charcoal iron tubes no supplementary discounts are granted, and the discount for 10,000 lb. to a carload is 4 points under base and for less than 10,000 lb. 8 points under base.

Standard Commercial Seamless Boiler Tubes

Tubes			
Cold-Drawn			
1 in.	68	3 in.	38
1¼ to 1½ in..	68	3¼ to 3½ in..	41
1¾ in.	68	4 in.	49
2 to 2¼ in....	27	4½, 5 and 6 in.	36

In the case of all sizes except 1-in. to 1 1/4-in. cold-drawn boiler tubes supplementary discounts of two 5 per cents are allowed on carload lots. On quantities up to 10,000 lb. the base discount is reduced 10 points and a supplementary discount of 5 per cent only is allowed. On quantities 10,000 lb. to 24,999 lb. the base discount is reduced 6 points and a supplementary discount of 5 per cent only is allowed. On 25,000 lb. to a carload the base discount is reduced 2 points and supplementary discounts of two 5 per cents are allowed.

On 1 to 1½-in. cold-drawn boiler tubes, there are no supplementary discounts. On quantities up to 10,000 lb. the base discount is reduced 12 points; on 10,000 lb. to 24,999 lb., it is reduced 8 points; on 25,000 lb. to a carload it is reduced 1 point.

Seamless Mechanical Tubing

Carbon, 0.10% to 0.30% base (carloads) 5
Carbon, 3.30% to 40% base..... 50
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, 60-lb. and heavier,	
per gross ton	\$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	\$32.00
Light rails (from rail steel) per gross ton	31.00

Spikes, 9/16 in. and larger

Spikes, 9/16 in. and larger	\$2.40
Spikes, 1/2 in. and smaller	2.40
Spikes, boat and barge	2.40
Tie plates, steel	1.90
Track bolts, to steam railroads	3.35
Track bolts, to jobbers, all sizes (per 100 count)	3.70

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts	70
Carriage bolts	70
Lag bolts	70
Pin bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped	70
Hot-pressed nuts, blank or tapped	70
Hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Semi-finished hexagon nuts	70
Semi-finished hexagon casted nuts	70
Store bolts in packages, P'gh	70, 25 and 10
Store bolts in packages, Chicago	70, 25 and 10
Store bolts in packages, Cleveland	70, 25 and 10
Store bolts in bulk, P'gh	70
Store bolts in bulk, Chicago	70
Store bolts in bulk, Cleveland	70
Tire bolts	70

Large Rivets

(½-in. and larger)

Base per 100 Lb.	
F.o.b. Pittsburgh or Cleveland	\$2.75
F.o.b. Chicago and Birmingham	2.80

Small Rivets

(7/16-in. and smaller)

Per Cent Off List	
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago and Birm'g'm	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List	
Milled cap screws, 1 in. dia. and smaller	75, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread, 3/4 in. and smaller	75 and 10
Upset hex. head cap screw, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	75 and 10
Upset set screws cut and oval point	75 and 10
Milled studs	65 and 10

STAINLESS STEEL

(18% Cr. 8% Ni. 0.08 to 0.12% C)

(Base Prices, f.o.b. Pittsburgh)

Per Lb.	
Bars	25
Plates	25
Sheets	25
Hot-rolled strip	25
Cold-rolled strip	25

SEMI-FINISHED STEEL

Wire Rods (Common soft, base)

	Per Gross Ton
Pittsburgh	\$36.00
Cleveland	38.00
Chicago	37.00
Birmingham	39.00
Youngstown (del'd)	37.00

ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem.
Base price, \$49 a gross ton except at Bethlehem, where it is \$51.
Price del'd Detroit is \$52.

CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago.
Uncropped, \$28 per gross ton.

COKE, COAL AND FUEL OIL

Coke	Per Net Ton
Furnace, f.o.b. Connellsville	\$3.85
Prompt, f.o.b. Connellsville	\$4.60 to 5.60
Foundry, by-product, Chicago	8.50
Ovens, for delivery outside switching district	9.25
Foundry, by-product, delivered in Chicago switching district	10.50
England, delivered	8.20 to 8.81
Foundry, by-product, Newark or Jersey City, del'd	9.00
Foundry, by-product, Philadelphia	9.25
Foundry, by-product, Cleveland delivered	4.75
Foundry, Birmingham	8.00
Foundry, by-product, St. Louis	9.00

Coal	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.80 to 2.05
Mine run coking coal f.o.b. W. Pa. mines	2.05 to 2.25
Gas coal, 1/2-in. f.o.b. Pa. mines	2.25 to 2.55
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.73c.
No. 5 industrial fuel oil	3.00c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.75c.
No. 4 industrial	5.50c.

REFRACTORIES

Fire Clay Brick	Per 1000 f.o.b. Works
High-heat Intermediate Duty Brick	\$45.00
Duty Brick	\$40.00
Pennsylvania	45.00
Maryland	55.00
New Jersey	45.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Chrome Brick	Per Net Ton
Standard size	\$45.00

Silica Brick	Per 1000 f.o.b. Works
Pennsylvania	\$45.00
Chicago	\$40.00
Birmingham	\$55.00
Silica clay, per ton	8.00

Magnesite Brick	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$65.00
Unburned, f.o.b. Baltimore	55.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd	\$44.00 to \$45.00
Chicago, del'd Chicago	47.00 to 48.00
6-in. and larger, del'd New York	43.00
6-in. del'd New York	46.00
6-in. and larger, Birmingham	36.00 to 37.00
4-in. Birmingham	39.00 to 40.00
Class "A" and gas pipe, \$3 extra.	

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.50	\$19.00	\$18.00	\$19.50
Bethlehem, Pa.	18.50	19.00	18.00	19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	19.00	18.00	19.50
Neville Island, Pa.	18.00	18.00	17.00	18.50
Sharpville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	17.50	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.00
Duluth, Minn.	18.00	18.00	17.50	18.50
Birmingham	13.50	12.50	18.00	18.00
Provo, Utah	16.50			

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	\$19.00	\$19.50	\$18.50	\$20.00
From Buffalo	19.00	19.50	18.50	20.00
Brooklyn				
From East, Pa. or Buffalo	20.77	21.27	20.27	21.77
Newark or Jersey City, N. J.	19.89	20.39	19.39	20.89
From East, Pa. or Buffalo	19.26	19.76	18.76	20.26
Philadelphia				
From Eastern Pa.	18.51	18.51	18.01	19.01
Cincinnati				
From Hamilton, Ohio	18.76	18.76		
Canton, Ohio	19.50	19.50		
From Cleveland and Youngstown	19.26	19.26		
Columbus, Ohio				
From Hamilton, Ohio	19.77	19.77		
Mansfield, Ohio				
From Cleveland and Toledo	19.55	19.55		
Indianapolis				
From Hamilton, Ohio	18.50	18.50		
South Bend, Ind.				
From Chicago	19.44			
Milwaukee				
From Chicago	19.26	19.26		
St. Paul				
From Duluth	20.04	20.54		
Davenport, Iowa				
From Chicago				
Kansas City				
From Granite City				

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$23.00
Johnson City, Tenn.	19.00
Del'd Chicago	24.65

GRAY FORCE PIG IRON

Valley furnace	\$17.50
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CHARCOAL PIG IRON

Lake Superior furnace	\$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.78

CANADA

Pig Iron

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

Per Gross Ton	
Domestic, 80%, seaboard, (carload)	\$85.00
Domestic, 80%, seaboard, (ton lots)	92.00

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$26.00

Electric Ferroalloy

Per Gross Ton Delivered	
50% (carloads)	\$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace			
Per Gross Ton		Per Gross Ton	
6%	.....\$22.25	12%	.....\$29.25
7%	.....23.25	13%	.....30.75
8%	.....24.25	14%	.....32.25
9%	.....25.25	15%	.....33.75
10%	.....26.25	16%	.....35.25
11%	.....27.75	17%	.....36.75

Bessemer Ferroalloy

F.o.b. Jackson, Ohio, Furnace			
Per Gross Ton		Per Gross Ton	
10%	.....\$27.25	14%	.....\$33.25
11%	.....28.75	15%	.....34.75
12%	.....30.25	16%	.....36.25
13%	.....31.75	17%	.....37.75

Manganese 1½ to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Manganese 1 1/2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	\$1.25 to \$1.25
Ferrotungsten, less carloads 1.30 to 1.35	
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrocromium, 2% carbon	16.50c. to 17.00c.
Ferrocromium, 1% carbon	17.50c. to 18.00c.
Ferrocromium, 0.10% carbon	19.50c. to 20.00c.
Ferrocromium, 0.06% carbon	20.00c. to 20.50c.

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$14.00 to \$14.50
No. 2 heavy melting steel	13.25 to 13.75
No. 2 railroad wrought	14.00 to 14.50
Scrap rails	14.00 to 14.50
Rails 3 ft. and under	15.50 to 16.00
Sheet bar crops, ordinary	15.00 to 15.50
Compressed sheet steel	14.00 to 14.50
Hand bundled sheet steel	12.50 to 13.00
Hvy. steel axle turnings	13.00 to 13.50
Machine shop turnings	10.50 to 11.00
Short shov. steel turnings	10.50 to 11.00
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Cast iron car wheels	13.00 to 13.50
Heavy breakable cast	12.00 to 12.50
No. 1 cast	13.50 to 14.00
Railr. knuckles and couplers	16.00 to 16.50
Rail car wheels	16.00 to 16.50
Roller steel wheels	16.00 to 16.50
Low phos. billet crops	17.00 to 17.50
Low phos. sheet bar crops	16.50 to 17.00
Low phos. plate scrap	15.50 to 16.00
Low phos. punchings	16.00 to 16.50
Steel car axles	17.00 to 17.50

CHICAGO

Delivered Chicago district consumers:	Per Gross Ton
Heavy melting steel	\$11.50 to \$12.00
Shoveling steel	11.50 to 12.00

Ferrovanadium, del., per lb. contained V.	\$2.70 to \$2.90
Ferrocobalt, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton	\$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18% Rockdale, Tenn. base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$38.00
Ton lots or less, per ton	48.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports	Per Gross Ton
Old range, Bessemer, 51.5% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68% iron	9.50c.
Iron, basic or foundry, Swedish, average, 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52%	24c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 49%	20c.

Per Net Ton Unit	
Tungsten, Chinese wolframite, duty paid, delivered	\$15.00
Tungsten, domestic scheelite, delivered	\$14.50 to \$15.00

Per Gross Ton	
Chrome, 45%, Cr.O., crude, c.i.f. Atlantic Seaboard	\$17.00
Chrome, 48% Cr.O., c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.

Fluorspar

Per Net Ton	
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	\$17.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	18.50
No. 3 lump, 85-5, f.o.b. Kentucky and Illinois mines	\$17.50 to 18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

Hydraulic comp. sheets	\$10.50 to \$11.00
Drop forge flashings	9.75 to 10.25
No. 1 busheling	10.50 to 11.00
Roller car wheels	12.50 to 13.00
Railroad tires	12.50 to 13.00
Railroad leaf springs	12.50 to 13.00
Axle turnings	9.50 to 10.00
Steel couplers and knuckles	12.25 to 12.75
Coil springs	12.75 to 13.25
Axle turnings (elec. fur.)	10.50 to 11.00
Low phos. punchings	12.25 to 12.75
Low phos. plates, 12 in. and under	12.75 to 13.25
Cast iron borings	7.25 to 7.75
Short shoveling turnings	7.25 to 7.75
Machine shop turnings	6.50 to 7.00
Rerolling rails	12.50 to 13.00
Steel rails, less than 3 ft. 12.50 to 13.00	
Steel rails, less than 2 ft. 13.00 to 13.50	
Angle bars, steel	12.25 to 12.75
Cast iron car wheels	11.75 to 12.25
Railroad malleable	12.00 to 12.50
Agricultural malleable	10.00 to 10.50

Per Net Ton	
Iron car axles	\$12.75 to \$13.25
Steel car axles	12.25 to 12.75
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	10.50 to 11.00

No. 2 busheling	\$4.50 to \$5.00
Locomotive tires, smooth	10.50 to 11.00
Pipe and flues	5.50 to 6.00
No. 1 machinery cast	9.50 to 10.00
Clean automobile cast	9.00 to 9.50
No. 1 railroad cast	9.00 to 9.50
No. 1 agricultural cast	8.50 to 9.00
Store plate	1.50 to 2.00
Grate bars	6.50 to 7.00
Brake shoes	8.50 to 9.00

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 1 railroad wrought	11.00
Hundred sheets	9.50
Hydraulic compressed, new	10.00
Hydraulic compressed, old	8.50 to 9.00
Machine shop turnings	7.50
Heavy axle turnings	10.00 to 10.50
Cast borings	5.50 to 6.00
Heavy breakable cast	11.50 to 12.00
Store plate (steel work)	9.00 to 9.50
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	14.50 to 15.00
Roller steel wheels	14.50 to 15.00
No. 1 blast furnace	5.50 to 6.00
Spec. iron and steel pipe	9.00 to 9.50
Shafting	16.00 to 16.50
Steel axes	14.50
No. 1 forge fire	11.00
Cast iron car wheels	13.00
No. 1 cast	13.00 to 13.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	13.00

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$12.00 to \$12.50
No. 2 heavy melting steel	11.50 to 12.00
Compressed sheet steel	11.50 to 12.00
Light bundled sheet stampings	8.50 to 9.00
Drop forge flashings	11.50 to 12.00
Machine shop turnings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Low phos. billet crops	14.50 to 15.00
Cast iron borings	8.75 to 9.25
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	9.00 to 9.50
No. 1 cast	11.00 to 11.50
Railroad grate bars	7.50 to 8.00
Store plate	7.00 to 7.50
Rails for rolling	15.00 to 15.50
Railroad malleable	17.00 to 17.50
Cast iron wheels	12.00 to 12.50
Cast iron wheels	12.25

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' yards:	
No. 1 heavy melting steel	\$13.00
No. 2 heavy melting steel	11.50
Scrap rails	\$12.25 to 12.75
New hydraulic comp. sheets	10.50
Old hydraulic comp. sheets	10.50
Drop forge flashings	11.00
No. 1 busheling	11.50
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Knuckles and couplers	14.50 to 15.00
Coil and leaf springs	12.50 to 13.00
Roller steel wheels	14.50 to 15.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
No. 2 busheling	9.00 to 9.50
Steel car axles	13.00 to 13.50
Iron axes	13.00 to 13.50
No. 1 machinery cast	13.00 to 13.50
No. 1 cupola cast	12.00 to 12.50
Store plate	10.25 to 10.75
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron car wheels	12.50 to 13.00
Industrial malleable	12.50 to 13.00
Railroad malleable	12.50 to 13.00
Chemical borings	10.00 to 11.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00
Scrap steel rails	8.00
Short shoveling turnings	8.50
Store plates	\$7.00 to 7.50
Steel axes	10.50 to 11.00
Iron axes	10.50 to 11.00
No. 1 railroad wrought	7.00
Rails for rolling	10.50
No. 1 cast	9.00 to 9.50
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$9.50 to \$10.00
No. 1 heavy melting	9.00 to 9.50
No. 2 heavy melting	8.25 to 8.75
No. 1 locomotive tires	9.50 to 10.00
Misc. stand.-sec. rails	9.50 to 10.00
Railroad springs	11.50 to 12.00
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 busheling	7.00 to 7.50
Cast iron borings and shoveling turnings	5.25 to 5.75
Rails for rolling	11.00 to 11.50
Machine shop turnings	5.25 to 5.75
Heavy turnings	6.00 to 6.50
Steel car axles	10.50 to 11.00
Iron car axles	13.50 to 14.00
No. 1 railroad wrought	6.00 to 6.50
Steel rails less than 3 ft.	12.50 to 13.00
Steel angle bars	10.00 to 10.50
Cast iron car wheels	8.75 to 9.25
No. 1 machinery cast	10.00 to 10.50
Railroad malleable	9.75 to 10.25
No. 1 railroad cast	9.00 to 9.50
Store plate	6.50 to 7.00
Agric. malleable	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00 to \$8.25
Scrap T rails	8.00 to 8.25
No. 2 steel	6.50 to 7.00
Breakable cast	6.50 to 7.00
Machine shop turnings	4.00 to 4.50
Bundled skeleton, long	6.00 to 6.50
Forge flashings	5.50 to 6.00
Blast furnace scrap	2.75 to 3.00
Shafting	11.00 to 11.25
Steel car axles	10.50 to 11.00
Wrought pipe	5.00 to 5.25
Cast iron borings, chemical	8.50 to 9.00

Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.50
No. 1 machinery cast	10.00 to 10.25
Store plate	7.00 to 7.25
Railroad malleable	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00 to \$9.50
No. 2 heavy melting steel	7.00 to 8.00
Heavy breakable cast	8.00 to 8.25
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	7.00 to 7.50
Store plate	6.00
Steel car axles	10.75 to 11.50
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	5.75 to 6.00

Forge fire	\$5.50 to \$6.00
Rails for rolling	9.00 to 9.25
Short shoveling turnings	3.00 to 4.00
Machine shop turnings	3.50 to 4.00
Cast borings	4.50 to 4.75
No. 1 blast furnace	2.50 to 4.00
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	5.00 to 5.50
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$12.00
No. 1 hvy. cast (cupola size)	10.50
No. 2 cast	9.00

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$8.75 to \$9.50
Scrap rails for melting	9.50 to 10.00
Loose sheet clippings	5.25 to 5.75
Bundled sheets	6.50 to 7.00
Machine shop turnings	6.00 to 6.50
No. 1 busheling	7.00 to 7.50
No. 2 busheling	4.00 to 4.50
Rails for rolling	10.00 to 10.50
No. 1 locomotive tires	9.50 to 10.00
Cast iron borings	12.25 to 12.75
No. 1 machinery cast	8.75 to 9.25
No. 1 railroad cast	10.00 to 10.50
Burnt cast	7.00 to 7.50
Store plate	7.00 to 7.50
Agricultural malleable	9.00 to 9.50
Railroad malleable	9.00 to 9.50

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$9.50 to \$10.00
Borings and short turnings	7.50 to 8.00
Long turnings	6.75 to 7.25
No. 1 machinery cast	11.00 to 11.50
Automotive cast	12.00 to 12.50
Hydraulic comp. sheets	9.75 to 10.25
Store plate busheling	8.00 to 8.50
New factory busheling	8.50 to 9.00
Old No. 2 busheling	5.75 to 6.25
Sheet clippings	6.25 to 6.75
Flashings	8.25 to 8.75
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:	
Toronto Montreal	
Heavy melting steel	\$5.50 \$5.50
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.50
Cast borings	3.00 3.00
Steel borings	2.00 2.00
Wrought pipe	2.50 2.50
Steel axes	4.50 6.00
Axles, wrought iron	4.50 6.50
No. 1 machinery cast	7.75 9.00
Store plate	4.50 5.00
Standard car wheels	7.25 7.00
Malleable	6.75 7.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.	
Plates	3.05c
Structural shapes	3.05c
Soft steel bars and small shapes	2.85c
Reinforcing steel bars	3.00c
Cold-finished and screw stock	3.45c
Rounds and hexagons	3.45c
Squares and flats	3.45c
Hoops and bands, under 1/4 in.	3.10c
Hot-rolled annealed sheets (No. 24)	3.15c
25 or more bundles	3.15c
Galv. sheets (No. 24), 25 or more	3.70c
Hot-rolled sheets (No. 10)	2.85c
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.32
Spikes, large	2.90c
Track bolts, all sizes, per 100 count	85 per cent off list.
Machine bolts, 100 count	65 per cent off list.
Carriage bolts, 100 count	65 per cent off list.
Nuts, all styles, 100 count	65 per cent off list.
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'd, base per 100 lb.	\$2.57c
Wire, galv. soft, base per 100 lb.	\$2.57c
Common wire nails, per keg	\$2.57c
Cement coated nails, per keg	\$2.57c

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.	
Plate and structural shapes	3.10c
Soft steel bars	2.90c
Cold-fn. steel bars and shafting	3.40c
Rounds and hexagons	3.40c
Flats and squares	3.40c
Bands, 3/16 in. (in Nos. 10 and 12 gages)	3.20c
Hoops (No. 14 gage and lighter)	3.20c
Hot-rolled annealed sheets (No. 24)	3.70c
Galv. sheets (No. 24)	4.30c
Hot-rolled sheets (No. 10)	2.85c
Spikes (9/16 in. and lighter)	3.50c
Track bolts	4.65c
Rivets, structural (keg lots)	3.10c
Rivets, boiler (keg lots)	3.10c
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap. or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head and cap screws	80
Cup point set screws	70
Flat head bright wood screws	37 1/2 and 10
Spring cotters	50
Store bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.75
Com. wire nails, base per keg	2.70c
Cement c'd nails, base per keg	2.70c

NEW YORK

Base per Lb.	
Plates	3.30c
Structural shapes	3.27c
Soft steel bars, small shapes	3.17c
Iron bars	3.24c
Iron bars, wred. charcoal	6.50 to 7.55c
Cold-fn. shafting and screw stock	3.92c
Rounds and hexagons	4.42c
Flats and squares	4.00c
Cold-roll strip, soft and quarter hard	3.42c
Hoops	3.42c
Hot-rolled sheets (No. 10)	3.17c
Hot-rolled ann'd sheets (No. 24)	3.65c
Galvanized sheets (No. 24)	4.25c
Long term sheets (No. 24)	5.00c
Standard tool steel	11.00c
Wire, black annealed (No. 10)	3.30c
Wire, galv. (No. 10)	3.80c

Tire steel, 1 x 1/2 in. and larger	3.50c
Open hearth spring steel	4.00c to 10.00c
Common wire nails, base, per keg	Per Cent Off List
Machine bolts, cut thread:	
Up to 1 in. dia. inclusive	60
Over 1 in. dia.	50
Carriage bolts, cut thread:	
Up to 1 in. dia. inclusive	60
Over 1 in. dia.	50
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.34c
Bars, soft steel or iron	3.14c
Cold-fn. rounds, shafting, screw stock	3.74c
Hot-rolled annealed sheets (No. 24)	3.94c
Galv. sheets (No. 24)	4.54c
Hot-rolled sheets (No. 10)	3.19c
Black corrug. sheets (No. 24)	3.99c
Galv. corrug. sheets	4.59c
Structural rivets	3.59c
Boiler rivets	3.99c
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	60
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	60
1000 lb. or over	55 and 5
200 to 999 lb.	55 and 5
100 to 199 lb.	50 and 5
Less than 100 lb.	50
*No. 26 and lighter take special prices.	

PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier	2.75c
*Structural shapes	2.75c
*Soft steel bars, small shapes, iron bars (except bands)	2.75c
*Reinforc. steel bars, sq. twisted and deformed	2.505c
Cold-finished steel bars	3.73c
*Steel hoops	3.30c
*Steel bands, No. 12 to 3/16 in.	3.05c
Spring steel	5.00c
*Hot-rolled annealed sheets (No. 24)	3.40c
*Galvanized sheets (No. 24)	4.00c
*Hot-rolled annealed sheets (No. 10)	2.95c
Diam. pat. floor plates, 1/4 in.	4.75c
Swedish iron bars	6.25c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For 5 tons or more, exclusive of cutting charge.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	3.21c
Soft steel bars	2.90c
Reinforc. steel bars	2.90c to 2.50c
Cold-finished steel bars	3.40c
Flat rolled steel under 1/4 in.	3.32c
Cold-finished strip	5.55c
Hot-rolled annealed sheets (No. 24)	3.76c
Galvanized sheets (No. 24)	4.36c
Hot-rolled sheets (No. 10)	3.01c
Black ann'd wire, per 100 lb.	\$2.45
No. 9 galv. wire, per 100 lb.	2.80
Com. wire nails, base per keg	2.45

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.30c
Bars, soft steel or iron	3.10c
New billet reinforce. bars	3.10c
Rail steel reinforce. bars	3.10c

PACIFIC COAST

Base per Lb.	
San Fran. Los Angeles Seattle	
Plates, tank and U.M.	3.50c 3.40c 3.40c
Shapes, standard	3.50c 3.40c 3.40c
Wide-flanged beams and columns	3.70c 3.60c 3.60c
Soft steel bars	3.55c 3.40c 3.40c
Reinforcing bars	2.35c 2.35c 2.35c
Hot-rolled annealed sheets (No. 24)	4.25c 4.15c 4.25c
Hot-rolled sheets (No. 10)	3.75c 3.65c 3.6

Railroad Equipment

THE PWA has given the Pennsylvania Railroad \$9,760,000 as the second instalment of its electrification and car building loan. Great Northern has signed contract for loan of \$4,935,000 for roadway improvements and rolling stock repairs. Contracts have also been signed by the St. Paul Road and the Receiver of the Central of Georgia for formal loans. The Lehigh Valley has received the second instalment of its rolling stock repair loan.

Gulf, Mobile & Northern has applied to I. C. C. for authority to borrow not more than \$1,000,000 from the PWA to purchase 150 50-ton, 50 composite 50-ton gondola cars, two passenger and two observation sleeping cars, and four motor cars equipped with 600-hp. Diesel engines.

Lehigh Valley has awarded five locomotives to Baldwin Locomotive Works subject to completion of necessary financial arrangements with PWA.

South African Railways are in the market for 50 locomotives.

Seaboard Air Line is inquiring for five Mallet-type locomotives and 1000 steel box cars.

Erie has ordered eight all-steel combination cars from American Car & Foundry Co., and 50 cement cars from Greenville Steel Car Co.

Boston & Maine is inquiring for de luxe seats and air-conditioning equipment for 10 passenger cars, and air-conditioning equipment for four dining cars.

Chicago Great Western has been allotted \$1,200,000 by PWA to purchase 500 box cars.

Central of Georgia has received an additional \$100,000 from PWA to purchase 200 70-ton coal cars instead of 50-ton cars as previously reported.

RAILS

Norfolk & Western is inquiring for 10,000 tons of 131-lb. rails.

Grand Trunk Western is inquiring for 4250 tons of 130-lb. head-free rails with fastenings and accessories.

New York, Ontario & Western has borrowed \$233,000 from PWA to purchase rails.

Maine Central has obtained permission from Interstate Commerce Commission to pledge 4½ per cent first mortgage bonds of Portland Ogdensburg Railway as collateral for a PWA loan to purchase 4200 tons of rails, fastenings, etc.

New York Central has placed orders for 38,900 tons of rails, of which 19,510 tons went to Bethlehem Steel Co., 17,490 tons to Illinois Steel Co. and 1900 tons to Carnegie Steel Co. In addition several thousand tons of track accessories were purchased.

Erie has bought 32,121 tons of rails and 12,000 tons of fastenings. Rails were awarded as follows: 17,512 tons to Carnegie Steel Co., 5857 tons to Illinois Steel Co., 4618 tons to Bethlehem Steel Co. and 2000 tons to Inland Steel Co. In addition 2134 tons of second-quality rails were prorated among the same mills.

Baltimore & Ohio is in the market for 35,000 tons of rails and about 15,000 tons of track accessories.

Great Northern has tentatively allotted 20,000 tons of rails.

Cast Iron Pipe

Bellingham, Mass., has awarded 200 ft. of 6-in. and 5000 ft. of 8-in. to Warren Pipe & Foundry Corp.

Hamilton Township, Trenton, N. J., care of C. S. Sincerbeaux, American Mechanics Building, engineer, plans water pipe line system in Yardville and White Horse districts. Cost over \$200,000 with other water facilities.

Hamilton, Ohio, has rejected bids for 36,000 ft., with fittings, and will soon ask new bids. R. P. Price is city manager.

Milwaukee has accepted bid of United States Cast Iron Pipe & Foundry Co. for 750 tons of 12-in. and 20 tons of 20-in. class C.

Hornersville, Mo., will take bids soon for water pipe system, pumping station, etc. Fund of \$30,000 has been secured through Federal aid. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is consulting engineer.

Southwest Water Corp., Joplin, Mo., care of Schink & Miller, 110 East Fourth Street, consulting engineer, plans 2 to 8-in. water pipe in Royal Heights district; also 150,000-gal. steel tank on 165-ft. steel tower. Fund of \$65,000 has been arranged.

Union Point, Ga., plans water pipe line system. Fund of \$38,000 has been secured through Federal aid for this and other water service expansion.

Cortner, Tenn., plans water pipe line system. Fund of \$20,000 is being arranged. C. N. Harrub, Shelbyville, Tenn., is engineer.

Tarboro, N. C., plans water pipe line extensions. Fund of \$200,000 has been arranged for this and other waterworks improvements.

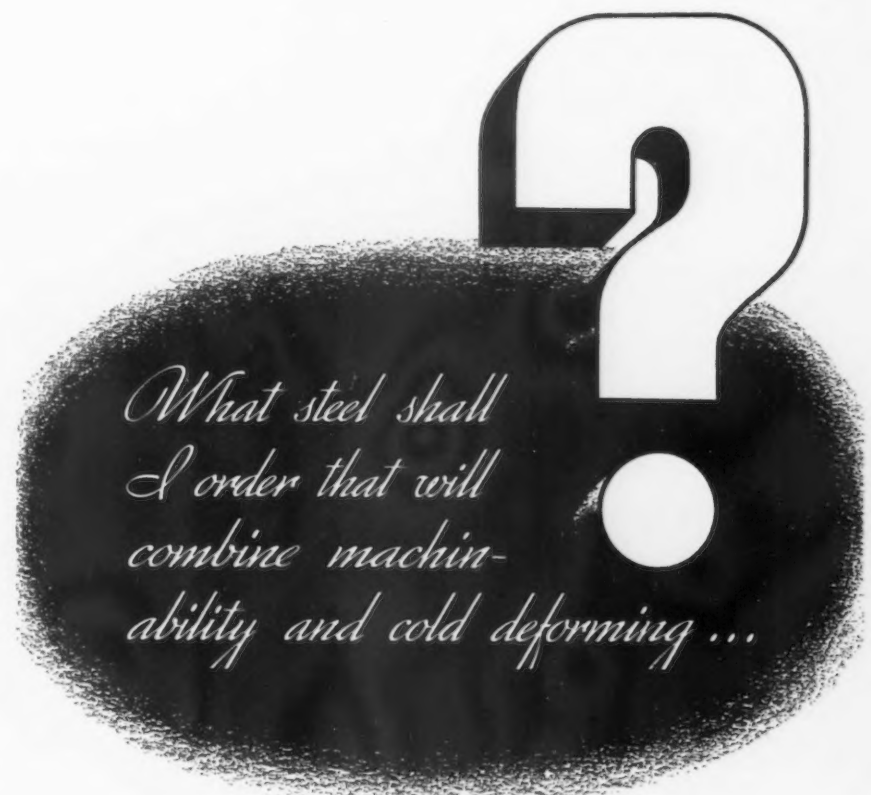
San Clemente, Cal., has authorized water system extensions at special election, including 46,750 ft. 4-in. and new waterworks pumping plant at San Jose Creek. Cost about \$40,000.

Union Gap, Wash., plans water pipe line system. Fund of \$36,780 is being arranged for this and other waterworks extensions. L. F. Fairbrook, 511 South Sixteenth Street, Yakima, Wash., is engineer.

Hayward, Cal., has awarded 265 tons of 12-in. to American Cast Iron Pipe Co.

Monterey, Cal., has taken bids on 140 tons.

Roseville, Cal., has taken bids on 216 tons of 6 to 16-in.



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Consumers Rush to Cover for Second Quarter As Prices Are Advanced On Practically All Products—Ingot Output Unchanged

PHILADELPHIA, April 3.—Steel company offices in this district have seen the greatest activity in a long time during the past week, as consumers have hastened to cover their second quarter finished steel requirements in the face of rather general price increases. In many cases contracts for the period had already been made, but buyers have sought to increase their allotments. Mills generally are not encouraging this practice, even though little speculative buying has been encountered. In the meantime releases against contracts have improved moderately, particularly in the case of structural shapes, reinforcing bars and some finishes of sheets. Steel ingot production in the district is holding its own at about 36 per cent of capacity, but with railroad and other releases heavier, there is every prospect for early improvement.

Increases in price have been definitely filed only on semi-finished steel and wire products. Billets, blooms and slabs have been marked up \$3 a ton to \$29, Pittsburgh, and sheet bars \$4 to \$30, Sparrows Point. Wire rods are to be \$2 a ton higher, while advances on finished wire products range from \$3 to \$5 a ton. Merchant bars are apparently to be advanced \$3 a ton to 1.90c., Pittsburgh, although mill representatives in this district have not been officially informed of such a filing. Definite information is also lacking on plates and shapes and local mills have not filed prices, evidently awaiting the action of other producers. It is safe to assume, however, that the increase will amount to either \$2 or \$3 a ton, bringing the asking price to 1.90c. or 1.95c., Sparrows Point or Bethlehem.

Railroad purchases are still an important factor in the market. The Norfolk & Western has placed a tonnage of bars, plates and shapes, in which Eastern producers shared. The Reading is also increasing its requirements for car repairs, and the Baltimore & Ohio is expected to take action before April 15 on rails, track accessories and miscellaneous requirements.

Pig Iron

The general increases in finished steel prices have encouraged many pig

iron consumers to cover their second quarter needs, although the prospect of an advance in iron quotations is still rather indefinite. It is believed that higher fuel costs as well as increased labor charges have considerably lowered the profit margin on pig iron. Large buyers continue to show no interest in their requirements and some of them claim to be covered for the quarter with stocks on hand.

Imports

The following iron and steel imports were received here last week: 1100 tons of chrome ore from Portuguese India, 550 tons of ferromanganese from Norway, 40 tons of pig iron from British India, and 10 tons of structural shapes and one ton of tungsten metal powder from Germany.

Bars, Plates and Shapes

The filing of increased prices on heavy hot-rolled products, which have not yet been general throughout the industry, has focused attention on second quarter contracting. As in the past, percentages of requirements contracts seem to be preferred by consumers and are least satisfactory to the mills who are not informed as to the probable needs of buyers. One large railroad is reported to have placed orders with a number of mills for one per cent of its needs and could of course vary the tonnage to suit its own purposes. The Belmont Iron Works has booked 1180 tons of structural shapes for an electrical substation at Philadelphia. The Rust Engineering Co. has not yet placed the 3000 tons required for the Middletown, Pa., army air field. Three highway bridges for the Pennsylvania Highway Department will require 2200 tons. Reinforcing bar demand is heavier but large projects are lacking. Another section of the Philadelphia-Camden bridge subway approach will be bid this week. Plate demand is confined largely to railroad orders for car repairs.

Sheets

Mills in this district have not yet filed higher sheet quotations, although advances announced by other producers are said to range from \$3 to \$8 a ton. Ordinary hot-rolled material is expected to be quoted at 2c., Pitts-

burgh, an increase of \$5 a ton, and galvanized sheets will be raised \$8 a ton to 3.25c., Pittsburgh. Second quarter contracting is heavy, but current specifications show little improvement. Demand from jobbers is slightly heavier.

Warehouse Business

Reported advances in finished steel mill prices have had their effect on demand for steel out of warehouses, and tonnage is somewhat improved. Distributors will likely pass the entire increases along to their customers, but are not yet sufficiently informed as to the course mills are following to take definite action.

Scrap

In spite of the spirited activity in the steel market, scrap remains very quiet in this district. The leading interest is buying heavily in a quiet way, but no sales to the smaller independents which might offer a test of the market have been reported. Under the circumstances, prices remain unchanged, although most of them are largely nominal in view of the lack of test.

Buying Stimulated At St. Louis

ST. LOUIS, April 3.—With the exception of wire products, there was a marked speeding up of specifications for finished steel for projects that had been held in abeyance. The gain in business is said to be due to the feeling in the trade that the 10 per cent advance in wages in the steel industry will be followed by a corresponding increase in prices. Wire products are still moving slowly, buying by the farming trade not being up to expectations.

The Commonwealth plant of the General Steel Castings Co. at Granite City has resumed operations with one furnace after a long idleness. Approximately 500 workers were engaged at the outset, and it is expected that this number will be increased about 1000 in the next two weeks.

Anticipating an advance in pig iron, a number of melters have come into the market for supplies, and the last week was exceedingly active. Melt is increasing, manufacturers of farm implement machinery, household appliances and electric motors being especially busy.

The scrap market was easier during the week, with no interest being shown by consumers. Because of a lack of demand by the mills, dealers have reduced their buying prices. Railroad lists: New York Central, 4000 tons; Missouri-Kansas-Texas, 450 tons, and Chicago, Milwaukee, St. Paul & Pacific, 200 carloads.

Fabricated Structural Steel

Awards Again Decline—New Projects Higher

LETTINGS of 8150 tons are the second lowest for any week this year and compare with 12,250 tons a week ago. The largest awards were 1500 tons for floor beams for the Midtown tunnel in New York and 1170 tons for the Richmond Station of the Philadelphia Electric Co. New projects of 18,300 tons compare with 10,400 tons last week and 21,400 tons two weeks ago. Included in new jobs are 5200 tons for bridges in Illinois and 2035 tons for a bridge at M Street, in Sacramento, Cal. Lettings in March totaled 84,750 tons compared with 55,225 tons in February and 60,890 tons in January.

NORTH ATLANTIC STATES

Boston, 1000 tons, parcel post building, to New England Structural Co.

Trumbull, Conn., 195 tons, highway bridge, to American Bridge Co.

New York, 1500 tons, floor beams for midtown tunnel, to Carnegie Steel Co.

Kings Park, N. Y., 290 tons, State hospital building, to Klein Iron Works, Inc.

Medina, N. Y., 140 tons, factory for H. J. Heinz Co., to McClintic-Marshall Corp.

Lewistown, N. Y., 100 tons, plant for Canadian Wineries Ltd., to McClintic-Marshall Corp.

Philadelphia, 1170 tons, unit 12 of Richmond Station, Philadelphia Electric Co., to Belmont Iron Works.

Butler, N. J., 910 tons, State highway bridge, to McClintic-Marshall Corp.

Everett, Pa., 170 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Washington, 240 tons, radio towers for Department of Commerce, to Blaw-Knox Co.

THE SOUTH

Charlottesville, Va., 200 tons, State highway bridge, to Roanoke Iron & Bridge Works.

State of Texas, 325 tons, bridges; 150 tons to Virginia Bridge & Iron Co., 175 tons to Austin Brothers Bridge Co., Atlanta.

CENTRAL STATES

Bartlett, Ill., 100 tons, bridge, to Mississippi Valley Structural Steel Co.

Chicago, 100 tons, Hiram Walker exhibition building at World's Fair, to Gage Structural Steel Co.

Chicago, 690 tons, building for Marshall Field Co., to Hansell-Elcock Foundry Co.

Chicago, 800 tons, addition to Davis store, to Hansell-Elcock Foundry Co.

Chicago, 410 tons, addition to Campbell Soup Co. building, to American Bridge Co.

Milwaukee, 125 tons, sewage plant, to Worden-Allen Co.

WESTERN STATES

Adams County, Colo., 105 tons, State highway bridge, to an unnamed bidder.

Claremont, Cal., 145 tons, warehouse, to Consolidated Steel Corp.

Bremerton, Wash., 320 tons, two cranes at Navy Yard, to Judson-Pacific Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Natick, Mass., 150 tons, artillery storage shed for Government.

Newton, Mass., 100 tons, school.

Greenwich, Conn., 200 tons, high school.

Brewster Village, N. Y., 200 tons, State highway bridge.

Rochester, N. Y., 280 tons, grandstand, CWA project.

Erie County, N. Y., 800 tons, nine highway bridges; all bids rejected and work to be re-advertised.

Dobbs Ferry, N. Y., 500 tons, high school.

Whippany, N. J., 300 tons, building for Agar Mfg. Co.

State of Pennsylvania, 2000 tons, two highway bridges in Forest County; bids April 13.

State of Pennsylvania, 200 tons, State highway bridge in Allegheny County; bids April 6.

West Elizabeth, Pa., 200 tons, State highway bridge.

Washington, 350 tons, warehouse extension.

THE SOUTH

Seaboard Airline Railway, 350 tons, bridge over Roanoke River at Bracey, Va.

Georgetown, S. C., 1300 tons, County bridges over Pee Dee and Wackamaw rivers.

CENTRAL STATES

Cleveland, 100 tons, State Hospital.

Toledo, Ohio, 300 tons of piling and structural steel for Wheeling & Lake Erie Railroad; bids taken March 31.

Austin, Ind., 250 tons, American Can Co. building.

State of Illinois, 5200 tons, 18 bridges.

Peoria, Ill., 250 tons, distillery building.

Chicago, 400 tons, packing plant exhibit at World's Fair.

Chicago, 230 tons, highway bridge over Patterson Avenue.

La Cresent, Minn., 250 tons, bridge.

Madison, Wis., 640 tons, Black Hawk grade separation; Eau Claire Engineering Co., Eau Claire, Wis., low bidder on general contract.

Omaha, Neb., 3800 tons, highway bridge; Omaha Bridge Co., low bidder on general contract at second letting.

WESTERN STATES

State of Colorado, 750 tons, three bridges.

Hot Sulphur Springs, Colo., 250 tons, State highway bridge.

Glasgow, Mont., 100 tons, dredge cranes, bids under advisement.

Southern Pacific Railroad, 480 tons, bridge at Gaviota, Cal.

Los Angeles, 560 tons, tunnel supports for Metropolitan Water District; bids April 23.

Sacramento, 2035 tons, State bridge at M Street over Sacramento River; bids soon.

Grand Coulee Dam, Wash., 600 tons, suspension bridge.

Pearl Harbor, T. H., 350 tons, extension to storehouse at Naval Base; bids April 25.

FABRICATED PLATE

AWARDS

Franklin, Pa., 135 tons, welded oil tank, to Chicago Bridge & Iron Works.

Philadelphia, 190 tons, miscellaneous plate work for Gulf Refining Co., to American Fabricated Steel Co.

Evansville, Ind., 125 tons, brewery tanks, to Wisconsin Gas & Construction Co.

NEW PROJECTS

Waukesha, Wis., unstated tonnage, 500,000-gal. elevated water tank and tower; bids about April 14.

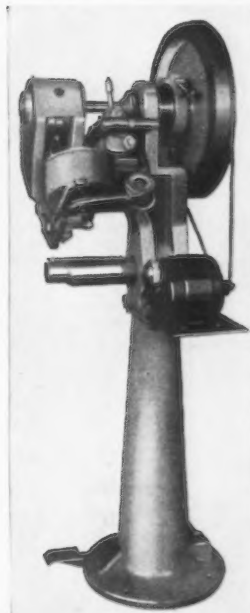
Fort Peck, Mont., 780 tons, discharge pipe for Government; McClintic-Marshall Corp., low bidder.

Monte Vista, Colo., 2000 tons, Santa Maria reservoir outlet; bids April 14.

Los Angeles, 1940 tons, tunnel linings for Metropolitan Water District; bids April 23.

Hydro-Mechanical Squeeze Riveter

developed to replace hydraulic or pneumatic machines.



100% FLEXIBILITY—The dies may be stopped at any point of die travel. The last third of die travel has uniform pressure which automatically takes care of variations in thicknesses of work.

100% TONNAGE ADJUSTMENT—Tonnage may be adjusted at will from zero to maximum capacity of the machine.

100% AUTOMATIC—Automatic feed is furnished on riveters for feeding and driving small as well as large **SOLID** iron, brass, or aluminum rivets automatically.

100% SAVINGS—The small power consumption, safety against accidents and tremendous production effect unusual savings.

NORIN ENGINEERING COMPANY

355 Union Park Court

Chicago, Ill.

Tin at New York Closes at 55.50c.; Zinc Weak at 4.30c. as Ore Drops \$2

Very Little Activity in Electrolytic Copper Is Expected
Until Code Is in Operation—Lead Still in Good Demand

NEW YORK, April 3.—The electrolytic copper market is almost completely idle, as there is a widespread reluctance among producers to make forward commitments at 8c. a lb. This cautious attitude is a reflection of a general desire to give full consideration to all code restrictions and conditions which may influence sales practices and market prices. Although one provision calls for the impounding of stocks, it is improbable that present consumptive requirements will exceed aggregate mine production and scrap conversion. Therefore, the price basis should not greatly alter until consumer demands materially increase. Foreign markets were mostly inactive during the seven-day period because of religious holidays, but moderate sales were made abroad this morning at 8.25c. a lb., c.i.f. Liverpool and Havre.

The copper code is now practically completed and should be presented and

signed by the end of the week. Wage rates and working hours have caused little dissension, but the industry is particularly interested in the sales and production restrictions which were practically imposed by the NRA authority. Almost all present stocks will be frozen, and future requirements of fabricators will be supplied from the output of new "Blue Eagle" copper. Sales quotas for producing companies have been established, and custom smelters are to be regulated as regards to monthly conversions. When sales exceed mine quotas, allocated stock reductions will be permitted.

Tin

Although London prices closed today about £1 under the price a week ago, Straits at New York could not be secured under 55.50c. a lb. This price is the highest since last November when dollar devaluation carried

the English pound to \$5.33. Domestic consumers continued to purchase on a rising market throughout the past week, and additional forward commitments will probably be made in view of the buoyancy of prices. Spot and future standard were priced at £237 5s. and £236 12s. 6d. respectively this morning, and Straits at Singapore was posted at £241. The strong tone of the present market is mostly a result of a general fear abroad concerning a possible shortage of supplies. This belief has considerable foundation in view of the steady depletion of Liverpool stocks, but there is at present sufficient metal in New York warehouses to cover domestic requirements during the next few months.

Zinc

There is only a negligible demand for spelter at 4.30c. a lb., East St. Louis, which indicates a definite expectancy of market offerings at a lower price. Consumers are inquiring for good tonnages of 4.25c. metal, but, so far, smelters have refrained from accepting these bids. Approximately 1500 tons of Prime Western was booked last week, which compares with 2000 tons sold during each of the two preceding weekly periods. A number of smelting companies recently avoided ore purchases with the object of bringing about a more equitable balance between ore and slab zinc prices. This attitude effected a \$2 a ton decline for all grades of concentrates late last week, and over 4900 tons was sold at the lower figure. An additional 1100 tons on contract at \$30 was released. Joplin shipments amounted to 3900 tons, and the stock surplus at the end of the week was estimated at 15,100 tons.

Lead

This commodity continued to be the most active metal last week, and all producers booked sufficient April tonnages to dispose of equivalent ore intakes. It is only the influence of poor statistics in recent months which is keeping the price at a 4c. level, and the trade generally expects stronger quotations on the appearance of firm inquiry in excess of aggregate contracted ore receipts. Producers shipped over 29,000 tons during March, April commitments now exceed 22,000 tons, and about 6000 tons has already been booked for May delivery.

Non-Ferrous Averages

THE average prices of the major non-ferrous metals for March, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, N. Y.*.....	7.75c. a lb.
Lake copper, New York.....	8.00c. a lb.
Straits tin, Spot, N. Y.....	53.84c. a lb.
Zinc, East St. Louis.....	4.37c. a lb.
Zinc, New York.....	4.72c. a lb.
Lead, St. Louis.....	3.90c. a lb.
Lead, New York.....	4.00c. a lb.

*Refinery quotations; price ¼c. higher delivered in Connecticut.

The Week's Prices. Cents Per Pound for Early Delivery

	March 28	March 29	March 30	March 31	April 2	April 3
Electrolytic copper, N. Y.*.....	7.75	7.75	7.75	7.75	7.75	7.75
Lake copper, N. Y.....	8.00	8.00	8.00	8.00	8.00	8.00
Straits tin, Spot, N. Y.....	54.65	55.25	55.37½		55.62½	55.50
Zinc, East St. Louis.....	4.32½	4.30	4.30	4.30	4.30	4.30
Zinc, New York.....	4.67½	4.65	4.65	4.65	4.65	4.65
Lead, St. Louis.....	3.90	3.90	3.90	3.90	3.90	3.90
Lead, New York.....	4.00	4.00	4.00	4.00	4.00	4.00

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98-99 per cent, 22.90c. a lb. delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 16c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 7.60c. a lb., New York.
Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.....	56.50c. to 57.50c.
Tin, bar.....	58.50c. to 59.50c.
Copper, Lake.....	9.75c. to 10.50c.
Copper, electrolytic.....	9.50c. to 10.00c.
Copper, castings.....	9.25c. to 10.25c.
*Copper sheets, hot-rolled.....	15.00c.
*High brass sheets.....	13.75c.
*Seamless brass tubes.....	16.25c.
*Seamless copper tubes.....	16.25c.
*Brass rods.....	12.25c.
Zinc slabs.....	5.75c. to 6.75c.
Zinc sheets (No. 9), casks, 1200 lb. and over.....	10.25c.
Lead, American pig....	4.75c. to 5.75c.
Lead, bar.....	5.75c. to 6.75c.
Lead, sheets.....	7.75c.
Antimony, Asiatic.....	9.00c.
Alum., virgin, 99 per cent, plus.....	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	18.00c. to 19.00c.
Solder, ½ and ½.....	33.00c. to 34.00c.
Babbitt metal, commercial grades.....	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	59.75c.
Tin, bar.....	61.75c.

Copper, Lake.....	9.00c.
Copper, electrolytic.....	9.00c.
Copper, castings.....	8.75c.
Zinc, slab.....	5.75c. to 6.00c.
Lead, American pig....	5.00c. to 5.25c.
Lead, bar.....	8.00c.
Antimony, Asiatic.....	9.00c.
Babbitt metal, medium grade.....	19.50c.
Babbitt metal, high grade.....	64.00c.
Solder, ½ and ½.....	35.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	6.50c.	7.25c.
Copper, hvy and wire.....	6.25c.	7.00c.
Copper, light and bottoms.....	5.25c.	6.25c.
Brass, heavy.....	3.50c.	4.25c.
Brass, light.....	3.00c.	3.625c.
Hvy. machine composition.....	4.75c.	5.625c.
No. 1 yel. brass turnings.....	4.25c.	5.125c.
No. 1 red brass or compos. turnings....	4.25c.	5.25c.
Lead, heavy.....	3.00c.	3.625c.
Zinc.....	2.50c.	3.125c.
Cast aluminum.....	9.50c.	11.25c.
Sheet aluminum.....	12.25c.	13.50c.

Reinforcing Steel

Awards 5225 Tons—New Projects 1900 Tons

AWARDS

New York, 850 tons, bars for midtown tunnel, to Carnegie Steel Co., previously reported to Concrete Steel Co.

New York, 1300 tons, tie rods for midtown tunnel, to Oliver Iron & Steel Corp.

Somerset County, N. J., 175 tons, highway mesh, to American Steel & Wire Co.

State of Pennsylvania, 200 tons, miscellaneous projects, to American Steel & Wire Co.

Pine Air, N. Y., 560 tons, State hospital, to American Bridge Co.

Rochester, N. Y., 350 tons, additions to Beechnut Packing plant, to Truscon Steel Co.

El Paso, Tex., 1020 tons, Nogales flood conduit, to Allison Steel Mfg. Co.

State of Colorado, 110 tons, highway work in two counties, to unnamed bidders.

Boulder Dam, 175 tons, to Sheffield Steel Co.

State of California, 105 tons, highway work in seven counties, to unnamed bidders.

Pearl Harbor, T. H., 200 tons, officers quarters at Naval Base, to Pacific Coast Steel Corp.

NEW REINFORCING BAR PROJECTS

Lexington, Mass., 610 tons, State road and bridge.

Newton, Mass., 100 tons, school.

Waltham, Mass., 100 tons, State hospital unit.

Gardner, Mass., 100 tons, storehouse.

Chicago, tonnage being estimated, addition to Davis Department Store, R. C. Wieboldt Co., general contractor.

Springfield, Ill., 200 tons, State highway projects, bids opened April 3.

Los Angeles, 165 tons, Figueroa Street tunnel No. 4; bids April 11.

Sacramento, 400 tons, State bridge at M Street, over Sacramento River; bids soon.

Pearl Harbor, T. H., 200 tons, extension to storehouse at Navy Base; bids April 25.

Pipe Lines

Oklahoma Pipe Line Co., Exchange Bank Building, Tulsa, Okla., has authorized steel pipe line for oil-gathering service at Pawhuska, Okla., and vicinity. Cost about \$45,000.

Plaquemine and Port Allen, La., plan joint steel pipe line for natural gas trunk line and distributing service in both municipalities. Cost about \$258,943. Financing is being arranged through Federal aid. L. J. Voorhies, Baton Rouge, La., is engineer.

Whatcom Natural Gas Co., Bellingham, Wash., plans steel pipe line in several county roads, work scheduled to begin in 60 to 90 days. Steel pipe line for natural gas distribution is also planned at Ferndale, Wash., where franchise is being secured.

Long Beach, Cal., has placed contract for 125,000 ft. steel pipe for municipal gas department, divided among Crane Co., Oil Well Supply Co., California Pipe & Supply Co., Republic Supply Co., National Supply Co., and Midway Supply Co., all of Los Angeles.

Joseph Greenspon's Son Pipe Corp., St. Louis, has submitted low bid to United States Engineer, Missouri River Division, Kansas City, Mo., for 18,300 ft. of 6-in. and 8-in. water pipe in connection with Fort Peck dam project.

Tacoma, Wash., will take bids soon for extensions and improvements in water supply system, including about 11 miles of 42, 52,

58, and 63-in. steel pipe (alternate bids will be asked on concrete pipe). Fund of \$1,000,000 has been arranged through Federal aid for this and other water service work. W. A. Kunigk is water superintendent.

Los Angeles has awarded 580 tons of 22-in. pipe to Southern Pipe & Casing Co.

New Prices Filed With Institute

NEW lowest base prices filed with the American Iron and Steel Institute follow:

	Base Price Per 100 Lb. Basing Point	F.o.b.
Concrete reinforcing bars—rail steel (effective April 6).....	\$1.95	Gulf Ports
Concrete reinforcing bars—new billet steel (April 6).....	2.00	Gulf Ports
Cold-finished sheets, mill run, No. 10 gage base (April 6).....	2.20	Pittsburgh
VII Special SAE 4615 electric furnace steel tubing for manufacture of bearings—9.74 lb. to 4 lb., incl., regardless of size (April 6).....	10.75	Shelby, Ohio

Butt-weld steel pipe, standard weight, for structural purposes only, effective April 8.

	Base Price, Per Cent	F.o.b. Basing Point
1/4 in. and 3/4 in. black	57 -5-5	Gary, Ind.
1/2 in. black.....	62 -5-5	Gary, Ind.
3/4 in. black.....	65 1/2 -5-5	Gary, Ind.
1 in.-3 in. black.....	67 1/2 -5-5	Gary, Ind.
1/4 in. and 3/4 in. galv.	38 1/2 -5-5	Gary, Ind.
1/2 in. galv.....	50 1/2 -5-5	Gary, Ind.
3/4 in. galv.....	55 1/2 -5-5	Gary, Ind.
1 in.-3 in. galv.....	58 1/2 -5-5	Gary, Ind.

The above discounts apply to standard pipe, plain ends and random lengths, to be sold only for direct shipment in carload lots to manufacturing consumers for use in structural purposes and not to be used for conveyance of gas, steam, liquids or air.

These discounts apply to standard list prices, for carload lots.

If the material should be sold through a jobber for direct shipment to manufacturing consumers, in carload quantities, an extreme commission of 5 per cent may be allowed on the basing point value of the material.

	Base Price Per 100 Lb. Basing Point	F.o.b.
Merchant bars, rail steel (April 12).....	\$1.85	Cleveland
	Base Price Gross Ton	
Ingots—uncropped re-rolling grade (April 10).....	\$29.00	Birmingham

February Coke Output Advanced 12.6 Per Cent

RESPONDING in part to increased activity in the iron and steel industry, and in part to an unprecedented demand for household fuel, coke production in February increased sharply over that for January. The United States Bureau of Mines reports that the combined daily average of coke production for February was 12.6 per cent greater than for January, and was the highest rate recorded since August, 1933.

Production of by-product coke for the 28 days of February was 2,493,494 tons, or 89,053 tons per day, and the beehive production rose from 3578 tons per day in January to 4929 tons in February. Another favorable development in the industry was the decided decrease in stocks as merchant plant supplies declined 23 per cent to 1,807,803 tons at the end of February. This tonnage was the lowest stock on record since July, 1929.

NON-SHRINK, OIL HARDENING TOOL STEEL TUBING



The job of making ring dies, cutting dies, bushings spacers, etc., is half done when you start with Bissett Tool Steel Tubing. There is a size carried in stock to meet every requirement up to 12" O.D. and 2" wall thickness. Larger sizes can be supplied.

It eliminates forging, does away with annealing difficulties and cuts down machining cost.

We also supply special tubing to S.A.E. 52100 and S.A.E. 4615 analysis for Ball Bearing purposes.

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

THE BISSETT STEEL CO., INC.
945 E. 67th STREET, CLEVELAND, O.

Cincinnati

Worcester

Buffalo

British and Continental Steel

Demand Increasing

LONDON, ENGLAND, April 3 (*By Cable*).—The British position in pig iron is unchanged from last week, with a very active market and a scarcity of stock.

The heavy engineering industries which include shipbuilding have made considerable progress during the first quarter of this year and the motor car trade is particularly busy. As a result of the activity of these iron and steel consumers, production of semi-finished steel is increasing and the works are well booked with orders. Although new business is quieter this week in finished steel the outlook is improving, especially for rail sections and plates.

Persia has ordered five locomotives. The British Locomotive Co., Glasgow, has secured an order for 50 locomotives for South Africa against keen foreign competition.

Tin plates are dull, despite better inquiries, and foreign competition on this line is keen.

Continental iron and steel demand

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	\$9		
Billets, open-hrth.	\$5 10s.	to \$5 12s.	6d.
Tin plate, per base box	16s. 6d.	to 16s. 9d.	
Steel bars, open-hearth	\$7 17½s.	to \$8 7½s.	
Beams, open-hrth.	\$7 7½s.	to \$7 17½s.	
Channels, open-hearth	\$7 12½s.	to \$8 2½s.	
Angles, open-hearth	\$7 7½s.	to \$7 17½s.	
Black sheets, No. 24 gage.....	\$9 5s.		
Galvanized sheets, No. 24 gage.....	\$11 5s.	to \$11 15s.	

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £
Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

*Ingots	\$2 5s.		
*Billets, Thomas..	\$2 7s.		
Wire rods, No. 5 B.W.G.	\$4 10s.		
*Steel bars, merchant	\$3 2s. 6d.		
*Sheet bars.....	\$2 8s.		
Plates, ¼ in. and up	\$4 1s. 6d.		
*Plates, 3/16 in. and 5 mm.	\$4 3s. 6d.		
*Sheets, ½ in....	\$4 8s. 6d.		
*Ship plates.....	\$4 10s.		
*Beams, Thomas..	\$2 19s.		
*Angles (Basic)..	\$3 1s. 6d.		
Hoops and strip steel over 6-in. base	\$4		
Wire, plain, No. 8	\$5 7s. 6d.		
Wire nails.....	\$5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G..	\$8 15s.		

*Prices as established by European Raw Steel Cartel.

is quiet but requirements for semi-finished steel, beams and plates are satisfactory and the makers are assured employment for six to eight weeks.

International Rail Makers' Association has decided to leave prices unaltered during the second quarter. The price war with Polish steel makers continues, but French works have booked an order from Russia for 10,000 tons of steel tubes, and Belgian steel works have booked substantial Russian orders for beams and plates. Poland, however, is likely to secure a Russian order for from 10,000 to 15,000 tons of rolled steel.

German iron and steel activity is steadily improving with expansion in production and deliveries which will probably be augmented by the Government's new employment campaign.

Walsh Refractories Acquires New Plant

THE Walsh Refractories Corp., 4428 North First Street, St. Louis, has purchased the plant and clay properties of the North Missouri Refractories Co. (formerly Missouri Fire Brick Co.) at Vandalia, Mo. Acquisition of this plant will give the Walsh corporation a modern tunnel

kiln plant for producing high-quality fire brick and refractory shapes. This plant will be operated in conjunction with their St. Louis plant, which plant will be devoted to the manufacturing of glass house refractories from the famous Cheltenham fireclay, found only in St. Louis, high-temperature cements and other refractory specialties. The St. Louis plant has been operated by the Mississippi Glass Co., a Walsh interest, for over 50 years.

The officers of the Walsh Refractories Corp. are: N. S. Chouteau Walsh, president; C. J. Gundlach, vice-president; R. D. Humpheys, treasurer; J. L. Crawford, general manager; Fred H. Schwetke, superintendent; J. H. Fisse, sales manager, and H. Oswald, assistant sales manager.

The Job Ahead For Machinery

UNDER this title, the Farrell-Birmingham Co., Ansonia, Conn., has produced a booklet-editorial by Allen W. Rucker in collaboration with N. W. Pickering, president of the company.

The booklet discusses the question of technological unemployment and, using facts and figures from United States census reports, shows that there is no basis for the contention that the machine has permanently reduced the number of jobs available, but rather that it has created many more new jobs and has contributed largely to social and economic progress and advanced the standard of living.

Wire Formed to Your Specifications

E. H. Fitchener & Co.
200-206 WALNUT ST. BINGHAMTON, N.Y.

WIRE STAPLES
ALL SIZES

Connecting Rod Bores Finished to High Accuracy

(Concluded from Page 29)

clamping pressure, bores of unusual accuracy may be consistently produced.

Arrangement of this fixture may be seen in the illustration. The connecting rod is placed on plate A with the crankpin bore over pilot B. The small or wristpin hole is located over a flatted pin, C, for carrying the torque of the hone and thus relieving the clamping mechanism of this function. By pulling the lever D downward, the table E, through a rack and pinion arrangement, is raised until the rod is lightly clamped between plate A and the clamping points on the lower end of the bushing F. Thereupon the table and the bushing with the work-piece clamped between them move upward together. The pilot pin B is withdrawn automatically at a point intermediate between the lower and upper extremities of travel.

The hone, previously contracted by the depression of the pawls of the automatic head by the actuating bushing in the fixture, enters the connecting rod bore. After it has traveled a predetermined distance into the bore, the pressure against the pawls is released and the hone expands to the size of the bore. Through a synchronized rotary and reciprocating motion produced by the machine, the hone removes from the bore the amount of stock required to produce the diameter desired. Expansion of the hone ceases automatically when the diameter for which it has been set is reached; continued operation of the tool beyond this point serves only to impart to the bore a higher luster than is normally produced by the abrasive.

Upon completion of the honing operation the fixture is lowered by moving the lever D upward. As the fixture travels downward, the pawls in the automatic head are depressed and the hone is contracted, making it possible for the connecting rod to leave the hone without scratching or otherwise marring the work.

The fixture illustrated is only one of many types which may be adapted to this work. The pilot plate, holding sleeve and guide bushing of the fixture, can be made interchangeable, if desired, to accommodate various sizes of connecting rods.

Advantages of Individual Honing

The advantages of honing connecting rod bores individually by the new method described above may be summarized briefly as follows: The bores "clean up" consistently to closer limits with a minimum of abrasive wear. The discrepancies of each bore

ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

Drop Forged Wrenches



WRITE FOR
WRENCH CATALOG

*The Same Tool Quality that has put
ARMSTRONG TOOL HOLDERS
in over 96% of the Machine Shops
and Tool Rooms*

In ARMSTRONG Drop Forged WRENCHES you find the same qualities that have put ARMSTRONG TOOL HOLDERS in over 96% of the Shops and Tool Rooms: Strength beyond any need; the balance and finish of fine tools, each exactly suited to its purpose; a fineness of design and finish that mark a fine tool and a uniform excellence made possible by modern manufacturing methods. Leading plants are finding it sound business to standardize on ARMSTRONG WRENCHES.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

309 N. Francisco Ave., CHICAGO, U. S. A.
New York Sales Office: 100 Lafayette St.

are corrected individually, without being influenced by those of the adjacent bores. The accuracy of the finished bore is not affected by the lack of squareness of the bore with the face of the connecting rod. The hone "floats" in the bore and therefore the universal action needs be common to but one axis, namely, that of the bore. Only the amount of abrading action necessary to correct the inaccuracies of the individual part is required.

Tests the Battledock Floor

A TEST of the battledock floor developed by the American Institute of Steel Construction was recently made at the Bureau of Standards at Washington. It was proved, as had been contended, that the floor behaved with its supports as a unit when loads were applied. The test floor, having a span of 18 ft., consisted of 4-in. 7.7 lb./ft. rolled steel I-beams spaced 2 ft. apart. These beams supported rolled steel plates having a width of 2 ft. and a thickness of 1/4 in. Electric arc welds joined the plates and the I-beams along the middle of the upper flange of each beam.

The floor was loaded with pigs of cast iron, and strain-gage and deflection readings were obtained for live loads up to 200 lb./ft.² The load was then increased to 420 lb./ft.² with no indication of collapse. Provided the spacing of the beams does not exceed 100 times the thickness of the

plate, the test indicated that for ordinary spans the entire width of the plate may be assumed effective when designing a flat steel-plate floor of the type described.

Announces High-Gloss Nickel-Plating Process

A NEW process for the electro-deposition of nickel, known as the Pyrene high gloss nickel process, has been developed and is being licensed by the Pyrene Mfg. Co., Metal Finishing Division, 560 Belmont Avenue, Newark, N. J.

Besides giving deposits of brilliance and beauty, irrespective of thickness, it is claimed the process eliminates subsequent polishing or color-buffing, or any re-racking or re-cleaning previous to chromium plating. The throwing power of a chromium solution over the Pyrene nickel deposit is emphasized as superior. The process does not require major changes in equipment or preparatory cleaning methods.

Glass Houses

Translucent and colored glass bricks have been used experimentally in the construction of modern houses, and architects generally are giving this material more serious consideration. New toughened glass bricks and slabs are said to have half the strength and twice the elasticity of steel.

PLANT EXPANSION AND EQUIPMENT BUYING

Drop in Labor Efficiency Seen as Machine Tool Stimulant

WHILE machine tool inquiry is exceedingly brisk, orders are still lagging as compared with the recent weekly volume.

Builders, however, are optimistic concerning the future, with the chief factors in this feeling evolving from automotive conditions. For one thing, the apparent settlement of the labor difficulties in Detroit has removed a great deal of overhanging apprehension which was not confined to the automobile field alone. Another spur to modern tool installation is seen in the reduction in labor efficiency which will ensue if bonus and other incentive plans are eliminated in the motor car plants in accordance with labor pressure. To make up for resulting in-

creased labor costs if this occurs, the one solution will be the installation of more efficient tools.

The Willys-Overland Co., Toledo, which is in receivership, has taken steps to liquidate a great deal of its machinery equipment, which is being offered for sale by the Industrial Plants Corp., Columbus, Ohio. This includes equipment in the Toledo plant and in the plants of the Wilson Foundry & Machine Co., Pontiac, Mich., and Willys-Morrow Co., Elmira, N. Y. The machinery equipment of the main Willys-Overland plant and its subsidiaries consists of about 5300 tools of which 3000 are being offered for sale.

◀ NEW ENGLAND ▶

State Board of Education, State House, Boston, has plans for one-story practical arts building at State Normal School, Fitchburg, Mass., 62 x 116 ft., to include group of four shops, laboratory, etc. Cost about \$100,000 with equipment. Fund has been authorized. S. W. Haynes & Associates, 336 Main Street, Fitchburg, are architects.

Board of Selectmen, Blandford, Mass., plans rebuilding pumping plant for municipal water system, recently destroyed by fire. New pumping machinery and accessory equipment will be purchased.

Swett Brothers Heating & Appliance Co., Springfield, Mass., has been organized by Russell F. and Reginald K. Swett, 147 Dwight Street, to manufacture heating equipment and appliances.

Croft Brewing Co., Roxbury, Boston, has let general contract to Lawson W. Oakes, Inc., 100 Halleck Street, Boston, for one-story addition, 60 x 100 ft. for storage and distribution. Cost over \$35,000 with equipment.

◀ NORTH ATLANTIC ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 10 for 79 tons foundry pig iron (Schedule 2067); until April 13, one motor-driven radial drill (Schedule 2118-R) for Brooklyn Navy Yard; motor-driven toolmakers' precision lathes (Schedule 2098-R), tilting or dumping body trailer (Schedule 2119-R) for Brooklyn or Philadelphia Navy yards.

Rototiller, Inc., 21-24 Forty-fourth Avenue, Long Island City, manufacturer of farm machinery and equipment, parts, etc., is arranging for stock issue of \$225,000, part of proceeds to be used for expansion in production. C. W. Kelsey is president.

Standard Aircraft Corp., New York, has been organized by James Callanan, Darien, Conn., and associates, under direction of Herbert B. Bolton, 110 East Forty-second Street, New York, capital \$500,000, to manufacture airplanes and parts.

International Nickel Co., 67 Wall Street, New York, has let general contract to Fraser-Brace Engineering Co., Ltd., 107 Craig Street, West, Montreal, for addition to plant at Cop-

per Cliff. Cost over \$850,000 with converters and other machinery.

American Beverage Corp., 118 North Eleventh Street, Brooklyn, operating Carl H. Schultz Corp., same address, and other distillery and wine interests, has arranged a preferred stock issue of \$1,000,000, part of fund to be used for expansion in production, including development of liquor distribution facilities.

Hoffman Metal Products Co., Inc., New York, has been organized by Grover C. Hoffman, 1411 Fifth Avenue, New York, and Louis Vuolo, 2124 East Seventh Street, Brooklyn, to manufacture metal goods, hangers, racks, etc.

Department of Mental Hygiene, State Office Building, Albany, N. Y., asks bids until April 11 for electric generator and accessories for State institution at Middletown, N. Y.

Mason & Hanger Co., Inc., 500 Fifth Avenue, New York, engineering contractor, plans erection of mechanical works at Eleventh Avenue and West Thirty-eighth Street, in connection with contract for under-river portion of new midtown Hudson tunnel, recently secured. Machine and other shops for heavy and light work, air compressor plant and other units will be established.

Common Council, Wells, N. Y., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for new water system. Fund of \$65,000 has been secured through Federal aid. Barker & Wheeler, 36 State Street, Albany, N. Y., are engineers.

Jerome S. Katz & Co., Inc., Jersey City, N. J., metal products, has leased about 23,000 sq. ft., in local building at Pacific and Caven Point Avenues for smelting and refining works.

Chevrolet Motor Car Co., Grove Street, Bloomfield, N. J., with local assembling and distributing plant, has leased about 30,000 sq. ft. in neighboring LaFrance-Republic Corp. works, for expansion, including storage and distribution.

Buck Engineering Co., Inc., Freehold, N. J., has been organized by Karl O. Baird and David T. Buck, 39 South Street, to manufacture oil burners and oil-burning equipment.

Bamberger Broadcasting Service, Inc., 147 Market Street, Newark, N. J., Station WOR, has secured Federal permission for new broadcasting station at West Carteret, N. J., with 385-ft. steel tower, generating station and other units for 50,000-watt capacity. Cost over \$150,000 with equipment.

Burlington Distillery Co., Burlington, N. J., recently organized, has taken over former plant of Burlington Industrial Alcohol Co., East Pearl Street, and will remodel for new distillery. One-story addition will be built. Cost over \$50,000 with equipment.

Pennsylvania Blackboard Co., Inc., Slatington, Pa., plans rebuilding slate-working and finishing plant, including main factory unit, electric hoisting works and boiler plant, recently destroyed by fire. Loss about \$100,000 with machinery.

Eberly & Orris Mfg. Co., Mechanicsburg, Pa., manufacturer of automobile wheels and kindred products, plans rebuilding part of plant recently destroyed by fire. Loss about \$50,000 with equipment.

◀ BUFFALO DISTRICT ▶

General Fireproofing Co., Youngstown, Ohio, manufacturer of metal office and shop furniture, cabinets, shelving, etc., has taken over aluminum chair division of Aluminum Co. of America, Inc., Elmwood Avenue, Buffalo, and will remove equipment from latter works to Youngstown.

New York State Electric & Gas Co., Ithaca, N. Y., plans new electric power substations, transmission and distributing lines at Stillwater and Cocheton, N. Y. Cost over \$90,000 with equipment.

Solvay Process Co., Solvay, Syracuse, N. Y., has begun extensions and improvements in caustic soda works, to include installation of new machinery for production under electrolytic process, with increase in present capacity. Cost over \$75,000 with equipment.

◀ OHIO AND INDIANA ▶

Reeves Mfg. Co., Dover, Ohio, manufacturer of sheet metal products, etc., has purchased local building formerly occupied by Deis Fertig Co., and will remodel for branch plant for manufacture of wood heaters, parts and kindred specialties.

Brownell Co., 300 North Findlay Street, Dayton, Ohio, manufacturer of boilers, tanks, underfeed stokers, parts, etc., has asked preliminary bids on general contract for one-story boiler and plate shop, to replace unit destroyed by fire late last year. Installation will include overhead traveling crane. Cost close to \$70,000 with equipment.

Department of Public Service, Akron, Ohio, Fred E. Clemmer, service director, has authorized plans for new municipal electric light and power plant, for which fund of \$3,000,000 has been authorized. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Nelson Machine & Mfg. Co., 12507 Plover Street, Cleveland, has leased about 13,000 sq. ft., in one of buildings of Van Dorn Iron Works, Co., Ewald Avenue, S. E., for new plant.

Fremont Tool & Die Co., Fremont, Ohio, manufacturer of tools, dies and other equipment, has begun erection of one-story addition. Machinery will be installed to double present working force. Cost close to \$25,000 with equipment.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until April 10 for galvanized steel wire (Circular 407); until April 11, 15 acetylene cylinders, each 285 cu. ft. capacity (Circular 410), 18,500 hose clamps and 1200 tube clamps (Circular 406), magazine assemblies (Circular 368), 40 sets tensiometers (Circular 398); until April 12, 70 portable drills (Circular 401).

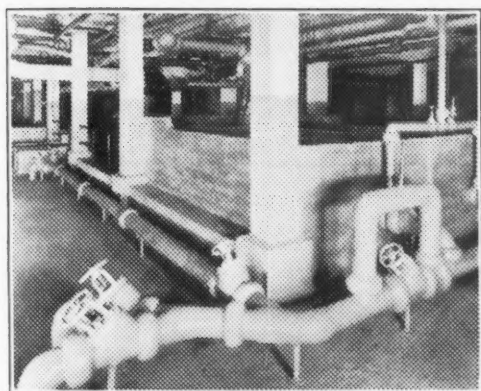
Service Foundry, Inc., Cleveland, has been organized by Philip H. Rabin and Max M. Meyer, 708 Guarantee Title Building, to manufacture iron and other metal castings.

Board of Public Works, City Hall, Fort Wayne, Ind., S. A. Snyder, secretary, asks bids until April 9 for electrical equipment for municipal waterworks. Cost close to \$45,000.

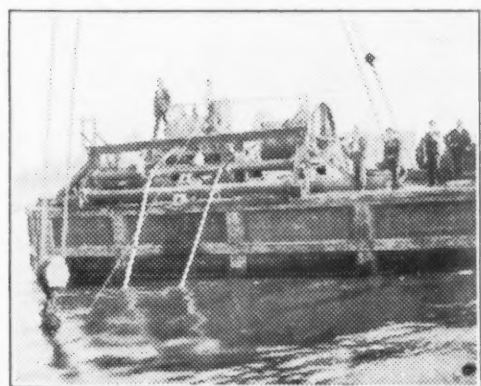
The Properties of LEAD

No. 4
Of A Series

SALT WATER CORROSION RESISTANCE



Lead pipe and valves are used exclusively to handle salt water in the Shedd Aquarium, Chicago.



Lead sheathed submarine cable being laid under the East River.

Among the metals commonly used in contact with salt water, only two, both of which are more costly, surpass lead in resistance to this type of corrosion. The following table shows the results of one series of tests, in which samples of hard and soft lead were exposed to sea water for four years.

Metal	Composition per cent	Original Weight of Samples	Total Loss in Weight	Loss as per cent of Original Weight
Lead, antimonial	Pb 98.4 Sb 1.6	4380 gms.	22.2 gms.	.51
Lead, soft	Pb 99.96	4396.4 gms	28.9 gms.	.65

Salt water corrosion tests have also been conducted on pure lead foil. The samples in this case were exposed to salt water solutions of varying strength for a period of two hundred days. The temperature of the solutions was 8.5°C.

NaCl Concentration in per cent	0	.25	.50	.75	1	1.5	3	6
Loss in Weight in per cent	.0334	.2331	.2626	.4003	.6982	.567	.243	.127
Corrosion Factor	100	697	786	1198	2090	1696	726	364

It is of interest to note that the rate of corrosion increases up to 1% and thereafter decreases, a loss in weight of approximately .25% occurring at 2.7% which is the salt concentration of sea water.

It is due to the high resistance to salt water corrosion, that lead is specified as a standard material of construction in the manufacture of pipe, pumps and valves used on ship-board, in aquariums, etc., and as sheathing for submarine cable.

ST. JOE
CHEMICAL LEAD

HERCULANEUM
DESILVERIZED LEAD

DOE RUN
SUPER-REFINED LEAD

BUNKER HILL
CORRODING LEAD

ST. JOSEPH LEAD COMPANY

250 PARK AVE. NEW YORK, N.Y.

The COUNTRY'S LARGEST



PRODUCER of DOMESTIC PIG LEAD

Water Department, City Hall, Anderson, Ind., W. J. Norton, superintendent, will ask bids soon on revised plans for equipment for municipal water plant and system, including new pumping station with two 1,000,000-gal. per day capacity pumping units, and other pumping equipment, dry feed chemical machines, filter equipment, tanks, etc. A fund of \$209,000 has been arranged. Allen & Vagt-borg, 205 West Wacker Drive, Chicago, are engineers.

City Council, Lafayette, Ind., has arranged with Civil Works Administration, 217 North Senate Avenue, Indianapolis, for new hangar unit, with repair and reconditioning shop, at municipal airport, in conjunction with other field units.

◀ SOUTHWEST ▶

City Council, Moberly, Mo., has called special election April 21 to vote bonds for \$700,000 for new municipal electric light and power

plant and electric distribution system, including two 2000-kw. turbo-generating units and accessories, two watertube boilers and auxiliary equipment. Russell & Axon, 4903 Delmar Boulevard, St. Louis, are consulting engineers.

United States Engineer Office, Missouri River Division, Postal Telegraph Building, Kansas City, Mo., asks bids until April 23 for buildings at construction camp for Fort Peck dam and hydroelectric power project, Missouri River, near Glasgow, Mont., including equipment storage and distributing buildings, oil storage building, gasoline storage tanks, pumping plants and other units (Circular 64).

Adolph Busch, Inc., 1109 Title Guarantee Building, St. Louis, will take bids soon on general contract for new multi-unit brewing plant on site, 305 x 320 ft., including five-story brew-house, mechanical bottling works, malt mill, storage and distribution units, and other structures, with refrigerating plant and power house. Latter will include Diesel engine-generator units, two 250-hp. watertube

boilers, automatic stokers, boiler feed pumps and auxiliaries; refrigerating plant will be equipped with three refrigerating machines, compressors, electric hoists, etc. Cost over \$1,000,000 with machinery, instead of smaller sum previously noted. George E. Wells, Inc., Security Building, is consulting engineer.

Common Council, California, Mo., will take bids early in May for new municipal electric light and power plant. Fund of \$145,000 has been arranged. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Wichita Mill & Elevator Co., Wichita Falls, Tex., plans rebuilding part of plant recently destroyed by fire. Loss over \$350,000 with machinery.

Ordinance Property Officer, Fort Bliss, Tex., asks bids until April 9 for one bench drill grinder, two power hack saws, one sensitive spindle bench drill, two grinders, two band saws, one set wood-turning tools, one spray gun, air compressor, generator, oxygen regulators, welding torches, acetylene regulators, arc welder, electric hammer, lubricating gun, lift truck, water softener and other equipment (Circular 1).

Commanding Officer, San Antonio Arsenal, San Antonio, Tex., asks bids until April 12 for one hand-operated portable elevator (Circular 11).

◀ WESTERN PENNA. ▶

Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, has let general contract to H. K. Ferguson Co., Hanna Building, Cleveland, for one-story addition to branch plant at Clarksburg, W. Va. Cost about \$125,000 with equipment.

United States Engineer Office, Pittsburgh, asks bids until April 10 for improvements to upper approach, Lock No. 4, Monongahela River, near Rostraver, Pa., including steel and iron castings, steel reinforcement, conduit, etc. Fund of \$147,000 has been arranged.

Fensenmeier Brewing Co., Huntington, W. Va., has work under way on modernization and improvements in former plant of West Virginia Brewing Co., including additional equipment. Cost over \$200,000 with machinery.

Town Commission, Matoaka, W. Va., plans installation of pumping machinery and other equipment, pipe lines, etc., for new municipal water system. Fund of \$50,000 has been arranged.

◀ MIDDLE WEST ▶

Bersted Mfg. Co., West Sixty-fifth Street and Fifty-second Avenue, Chicago, manufacturer of metal products, has taken over a factory at Fostoria, Ohio, for new branch plant. Work will soon begin on one-story addition to existing unit. Cost over \$25,000 with equipment.

Lincoln Oil Refining Co., Robinson, Ill., plans rebuilding part of refinery recently destroyed by fire. Loss about \$50,000 with equipment.

Garbe Iron Works, Inc., 41 Clark Street, Aurora, Ill., has been organized by Frank B. and Ralph J. Garbe, to operate a general iron works.

City Council, Corning, Iowa, has rejected bids recently received for equipment for new municipal electric light and power plant and will take new bids early this month. Installation will include three Diesel engine-generating units and accessories, oil tanks, cooling pond equipment, terminal tower, pumping machinery, etc., and electrical distribution system. A fund of \$160,000 has been arranged through Federal aid. Young & Stanley, Inc., Muscatine, Iowa, is consulting engineer.

Welter Furnace Mfg. Co., Inc., Minneapolis, has been organized by Nicholas and M. A. Welter, 4306 Garfield Avenue, capital \$50,000, to manufacture furnaces, oil burners and other heating equipment.

Gluek Brewing Co., 2021 N. E. Marshall Street, Minneapolis, will take bids soon on general contract for two-story addition, 40 x 100 ft. Cost close to \$50,000 with equipment. Stebbins, Haxby & Bissell, 1111 Nicollet Avenue, are architects.

United States Engineer Office, St. Paul, Minn., asks bids until May 1 for mechanical equipment and lighting system at lock and dam No. 5, Mississippi River, near Fountain City, Wis., including hand-operated traveling

HELP

on production per
hour and cost per
unit problems . . .

Thomson-Gibb is keeping pace with changing conditions in industry. Demands for higher production, lower costs and improved products are met by new production welding methods, new and improved welding equipment.

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General Offices—Lynn, Massachusetts

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Gentlemen:

☐ Please ask your nearest engineer to arrange for an appointment at our plant.

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Product _____

Metal _____

Approximate dimensions _____

Desired production per hour _____

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Company _____

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Enterprising coal dealers "wet down" each truckload of coal in order to lay the dust. This "plus" service feature builds customer good will... The tar-sealing process, invented by Basic Dolomite, Incorporated, does away with lime dust in the field of dolomitic clinker. Refiners of steel are pronouncing this feature highly advantageous.

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improves the lot of the WORKMAN

When labor efficiency is raised by various methods, the gain is not always an unmixed blessing. When the yield from manual effort is increased and at the same time more favorable working conditions are attained, the benefit is twofold... The elimination of lime dust should serve to promote the productive efficiency of men on the

open hearth floor—AND to improve morale. All this would seem to be accomplished by the tar-sealing process as applied to Magnefer. The process was originated by Basic Dolomite, Incorporated... To use an uncoated clinker is to forego a "plus" feature which may now be had without additional cost to refiners of steel.

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MAGNEFER SETS FAST · STAYS FAST



MAGNEFER

bridge crane, remote control switchboard cabinets, transformers, regulators, dam power feeders, storage yard lighting equipment, portable lighting equipment, air signal equipment, etc. (Circular 119).

City Council, Devils Lake, N. D., has plans for new municipal electric light and power plant, for which fund of \$300,000 is being arranged through Federal aid. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Northern Pacific Railway Co., Railroad Building, St. Paul, Minn., has plans for one-story addition to engine house and shops at Jamestown, N. D. Cost about \$25,000 with equipment. O. M. Rognan, address noted, is company architect.

City Council, Winona, Minn., has been allotted Federal loan of \$270,000 for sewage disposal plant designed by Greeley & Hansen,

consulting engineers, 6 North Michigan Avenue, Chicago. Bids will be taken about May 1. E. E. Chadwick is city engineer.

Industrial Lubrication Co., 606 West Wisconsin Avenue, Milwaukee, established three years ago to manufacture new type of all-purpose lubricating devices, has moved headquarters and plant to Burlington, Wis. L. Roy Smith is president and general manager.

◀ SOUTH CENTRAL ▶

C. P. Moorman & Co., Louisville, distillers, are arranging for stock issue of \$1,125,000, part of fund to be used for expansion.

Fabick-Murphy Tractor Co., 185 Butler Street, Memphis, Tenn., has been organized by John Fabick and J. F. Murphy, 387 South

Main Street, capital \$100,000, to manufacture tractors and parts.

General Carbon & Chemical Corp., Dallas, Tex., care of O. W. Wahlstrom, 3408 Stanford Street, Dallas, president, recently organized, plans new works for manufacture of carbon products on 4-acre tract near Monroe, La. Cost over \$160,000 with machinery.

Common Council, Burkesville, Ky., plans installation of pumping machinery and auxiliary equipment, pipe lines, fittings, etc., for municipal waterworks. Fund of \$48,000 has been arranged. J. S. Watkins, Citizens Bank Building, Lexington, Ky., is engineer.

Director of Purchases, Tennessee Valley Authority, New Sprinkle Building, Knoxville, Tenn., asks bids until April 17 for four suspended tank indicating type scales, gross capacity 3200 lb., complete with supporting columns, etc., for fertilizer works, nitrate plant No. 2, Sheffield, Ala.; until April 10, steel ash and operators for same plant.

Common Council, Parsons, Tenn., plans installation of pipe lines, pumping machinery and other equipment for waterworks. Fund of \$90,000 is available.

◀ SOUTH ATLANTIC ▶

Atlanta Stove Works, 112 Krog Street, N. E., Atlanta, Ga., will proceed by day labor on erection of one-story addition, 50 x 100 ft., including improvements in present plant. Cost over \$25,000 with equipment.

Lombard Iron Works & Supply, Augusta, Ga., will use recently leased factory at East Spartanburg, S. C., for branch works for manufacture of textile machinery and parts. It is proposed to begin operations this month. R. A. Vanderford is general manager.

Highland Mills, Griffin, Ga., will build new one-story machine shop, 40 x 60 ft., at local cotton mills, in connection with new multi-story main mill unit, for which general contract has been let to Batson-Cook Co., Inc., West Point, Ga. Entire project will cost about \$90,000 with equipment. Robert & Co., Inc., Bona Allen Building, Atlanta, Ga., is architect and engineer.

Common Council, Prosperity, S. C., plans installation of pumping machinery and other equipment, pipe lines, etc., for new municipal waterworks. Fund of \$45,000 has been secured through Federal aid.

Armature Winding Co., McNinch Street, Charlotte, N. C., is in market for machine tools, including turret lathe, radial drill, key seaters, etc., also for an air compressor, power feed regulator and electric motors.

◀ WASHINGTON DISTRICT ▶

Quartermaster, Marine Corps, Washington, asks bids until April 9 for malleable iron pipe fittings, cast iron pipe fittings, bushings, nipples, gages, brass pipe fittings, etc. (Schedule 424).

City Council, Danville, Va., is arranging special election to approve bonds for \$5,000,000 for municipal hydroelectric power plant in Patrick County, with transmission line to city, substation, switching station, etc. E. C. Brantley, city manager, in charge.

Bureau of Supply, Procurement Division, Treasury Department, Washington, asks bids until April 19 for blacksmiths' anvils, awls, axes, knives, pliers, files, hammers, tool handles, belt-lacing machines, picks, pumps and parts, pipe taps, threading sets, nail sets, sledges, vises, wrenches, trowels, saws, rakes, ratchet braces and other tool (Class 41).

National Color Printing Co., 916 East Monument Street, Baltimore, has plans for new two-story plant, 90 x 170 ft. Cost about \$50,000 with equipment. Sandlass & Wieman, 107 West Saratoga Street, are consulting engineers.

General Purchasing Officer, Panama Canal, Washington, asks bids until April 13 for one gasoline engine, four hoisting pinions, one steam boiler, brass machine screws, ventilating fan, 10,000 lb. copper wire, copper cable, etc. (Schedule 2951).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April



Machined part with half-shell section, 7/8" x 2 7/16", made from Ultra-Cut Screw Stock at 100% increased rate of production.

COMPLETE in half the regular time

PERFORMANCE is steadily winning new converts to the use of ULTRA-CUT STEEL.

Its record on this job is typical—time of production shortened by half, and without sacrifice of quality in the finished work.

Based on a preliminary study of the operation, 7/8" round Ultra-Cut Screw Stock was recommended for machining of this part on a 5-spindle automatic.

Tests taken on various production runs show an easily maintained rate—twice the regular production—turned, bored and threaded—with a smooth, bright machine finish and a definite adherence to specified size tolerance.

Such results may suggest to you some profitable uses of Ultra-Cut Steel in your high-speed automatic screw machine operations.

We shall welcome an opportunity of working with you in determining the proper steel grade for your machining requirements.

COLD DRAWN STEELS
ULTRA-CUT SCREW STOCK
TURNED SHAFTING,
Ground or Polished.
EXTRA WIDE FLATS
SPECIAL SECTIONS

BLISS & LAUGHLIN, INC.
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EXIDE-IRONCLAD BATTERIES

get things done—at a saving



The active material of Exide-Ironclad positive plates is retained by slotted rubber tubes and exposed freely to the electrolyte. That is one of the reasons for their exceptional dependability and power.



Exide

IRONCLAD BATTERIES

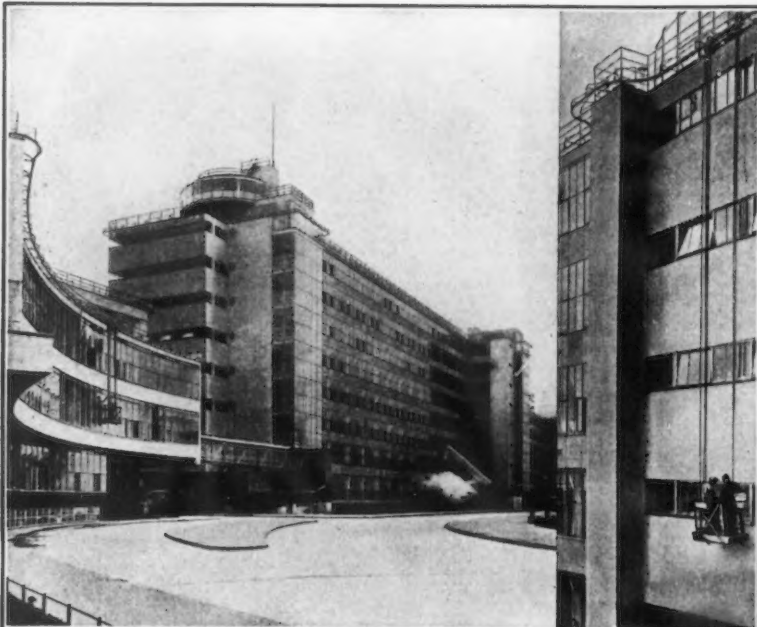
REPORTS from operators of electric industrial trucks, tractors and locomotives in all parts of the country show why Exide-Ironclad Batteries cut material-handling costs. "6½ years of steady service—still in excellent condition without a cent ever spent for repairs." "Twelve hours service a day for 6 years." "Up and down a 20% grade all day long, with never a perceptible drop in power." These are typical of the comments.

Adding to the satisfaction of using Exide-Ironclad Batteries is their immense reserve of power—ample to care for exceptional loads and grades, and delivered from morning to night. Their uninterrupted service, long life, freedom from trouble, and economy at the charging panel all join together to cut costs.

We will gladly furnish information on the specific application of Exide-Ironclads to industrial truck and switching locomotive service in your plant. Write for booklet, "Facts," for consideration in selecting a battery.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Cleanliness, Profits and Good Lighting



One of six installations by one Company

CLEANLINESS is profitable if you consider its effects on production only.

An important part of cleanliness is Clean Windows.

Dirty windows are expensive—they necessitate the use of an excess of artificial light and increase the possibilities of accidents.

Clean Windows provide the maximum of Natural light. To this end regular window cleaning should become a part of the routine of any plant. Clean windows are of utmost importance in relieving fatigue of workers, lowering the accident record and increasing production.

Safe—Cost reducing Window Washing Equipment as illustrated was pioneered by Cleveland Tramrail, the first system being installed in 1921.

Consult your 'phone directory under Cleveland Tramrail

CLEVELAND



TRAMRAIL

Hand or Electric
Overhead Materials
Transportation Equipment

DIVISION OF
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE, OHIO

10 for steel bolts and nuts, lag screws, etc. (Schedule 2035) for Eastern and Western Navy yards.

◀ MICHIGAN DISTRICT ▶

Tivoli Brewing Co., 10129 Mack Avenue, Detroit, has let general contract to **Martin-Krausmann Co.**, 955 East Jefferson Street, for six-story brew and malt-house addition, 47 x 68 ft. Cost close to \$100,000 with equipment. **Mildner & Eisen**, Hammond Building, are architects.

Barkeley-Mattson Corp., 8227 Hamilton Street, Detroit, manufacturer of mechanical and automotive equipment, small parts, etc., has taken over factory property on Jackson Street, Pontiac, Mich., and will remove to new location and increase capacity.

Modern Aviation Motor Corp., Detroit, has been organized by **Charles Mosier**, 6471 Minock Avenue, and associates, to manufacture aircraft appliances and equipment.

Continental Malt Co., Detroit, care of **G. A. Mueller**, 1346 Broadway, architect and engineer, organized a few months ago, will begin work soon on new multi-unit plant on site, 400 x 900 ft., Highland Park district. A power house and machine shop will be built. Entire project will cost about \$500,000 with equipment. **Martin E. Galvin** is president.

Tests of Bare and Coated Ferrous Metals

(Concluded from Page 34)

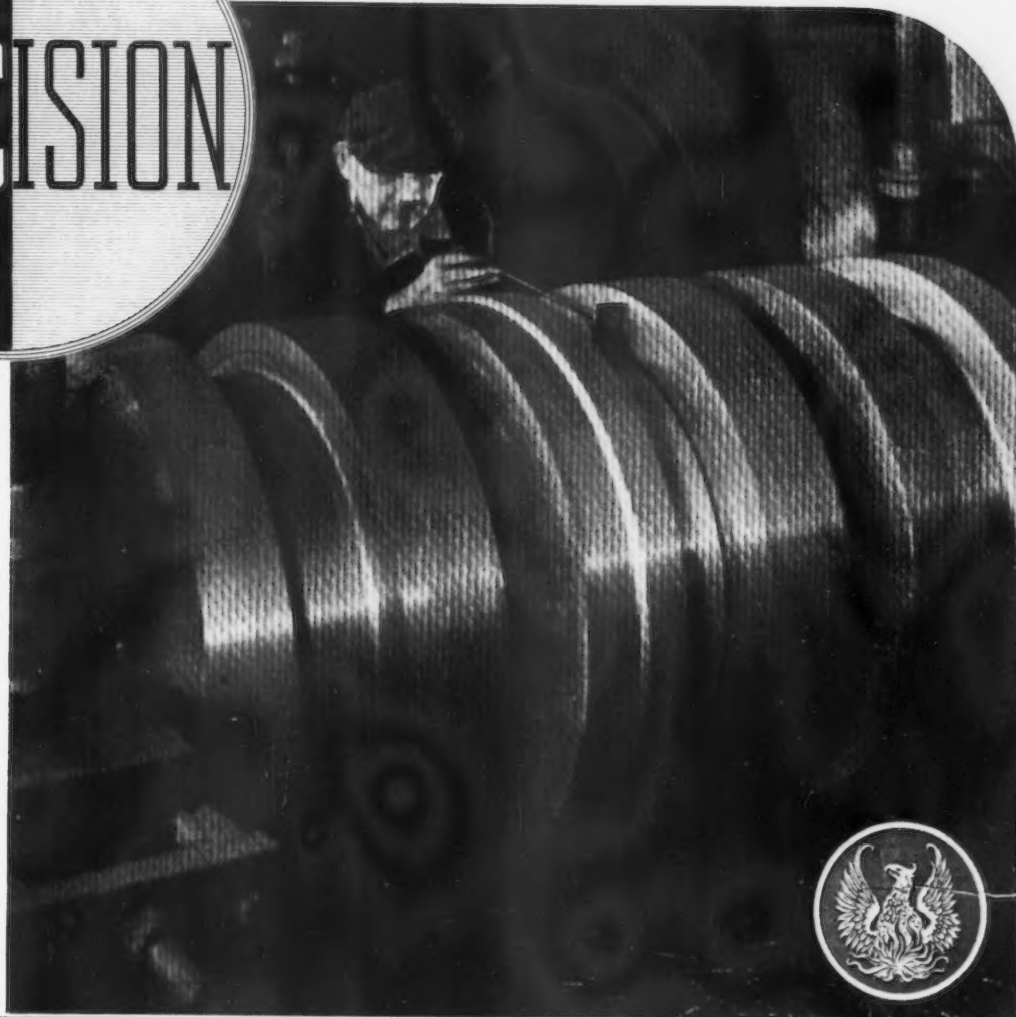
thickness of the coating and the atmosphere of the location, as indicated in the accompanying illustration, for which data were taken from the 1933 *Proceedings* of the society. The life is expressed as the time required for the development of the first rust spots. A second set of curves shows the time required for subsequent rust development, these being the records of exposures at Pittsburgh.

Zinc-Coated Hardware

As regards zinc-coated commercial hardware: (1) The coatings are judged to be distinctly less uniform than hot coatings on sheets; (2) Hot-dip zinc coatings are showing themselves better than electroplating or sherardizing, which appear about equally protective; (3) Shapes of specimens distinctly affect the uniformity of plated coats; (4) Evidence of selected specimens indicates that all three types of zinc coatings can be equally protective when good uniformity is attained.

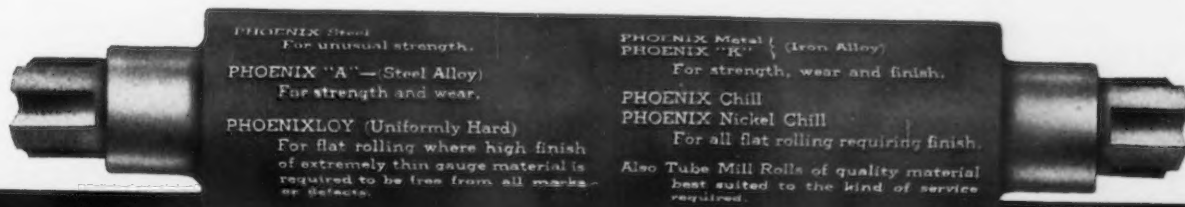
As regards other coatings on commercial hardware: (1) Hot-dipped aluminum coatings afford good protection; (2) Parkerizing shows up poorly in the tests; (3) Lead coatings are generally poor, but seem to approach parity with the best coatings in industrial atmospheres; (4) The cadmium plated specimens under test are consistently less protective than the plated zinc ones.

MODERN ROLL TECHNIQUE



THE ultimate check for exact adherence to specifications and final finish of Phoenix Rolls, is made by men of long experience and special training. These men thoroughly understand the service required of each roll leaving the plant.

Opportunity is taken to accord commendation to those engaged in roll turning throughout the steel industry. These men through their special knowledge and technique, have substantially contributed to progress of the industry and the production of quality steel.



PHOENIX Steel
For unusual strength.

PHOENIX "A"—(Steel Alloy)
For strength and wear.

PHOENIXLOY (Uniformly Hard)
For flat rolling where high finish
of extremely thin gauge material is
required to be free from all marks
or defects.

PHOENIX Metal { (Iron Alloy)
PHOENIX "K"

For strength, wear and finish.

PHOENIX Chill

PHOENIX Nickel Chill

For all flat rolling requiring finish.

Also Tube Mill Rolls of quality material
best suited to the kind of service
required.

PITTSBURGH ROLLS CORPORATION

PITTSBURGH, ... PA.

The Waste of Uncontrolled Productive Capital

(Concluded from Page 32)

sighted, to say the least. It is becoming clear that trade association work is going to be of permanently greater importance and the wise management is strengthening its organization to

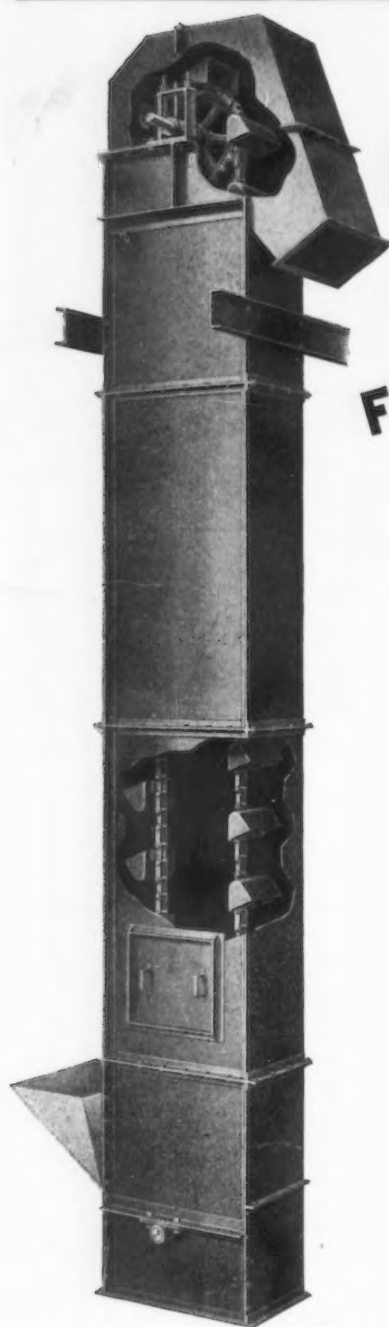
take part in forming sound trade policies.

Certainly when we face an increasing rather than decreasing rate of obsolescence, excessive shortening of

operating hours would seriously handicap progress and diminish the opportunity to provide new machinery, which is the very basis of the improved standard of living we all want.

Finally, it may be asked whether there is still to be a substantial market for capital goods on anything like the scale we have known in the past. Some of the planned economy protagonists seem to believe that we will not. No observant reader of THE IRON AGE can fail to have gathered, from its weekly evidence of new methods, the enormous scope for new equipment of all kinds—consider, for example, the equipment required by Ford on one item alone—the new crankshaft production method recently described. Every progressive institution has similar programs ready to start if they can have some assurance of steady employment for the capital so invested. The thing for each industry to do is to move forward to more intensive use of its capital and so meet the challenge of change.

LINK-BELT



Bucket Elevators
FOR ALL MATERIALS

The Link-Belt line of cost-reducing elevating and conveying equipment is complete, and includes all such elements as chains, sprockets, buckets, power transmission units, belt conveyor idlers, flight conveyors, bucket carriers, feeders, screw conveyor, etc.

We offer our products, our extensive facilities, and our wide experience, through the nearest office. Extensive stocks of standard Link-Belt parts are carried at convenient points throughout the country.

LINK-BELT COMPANY

Leading Manufacturers of Equipment for Handling
Materials Mechanically and Transmitting
Power Positively

INDIANAPOLIS CHICAGO PHILADELPHIA
SAN FRANCISCO TORONTO

Offices in Principal Cities

"Explodes" Aluminum Paint Mixture

BY exploding the powder lumps, which form during the processing of aluminum paint, Aluminum Industries, Inc., Cincinnati, claims to have developed an aluminum paint that spreads better, gives more thorough coverage and fuller protection.

The principles involved in this explosion process are best illustrated by comparing the ready-mixed paint to batter. When flour is mixed with water, there is a tendency for particles of the flour to form little solid lumps, practically dry on the inside but wetted on the outside by the water. It is virtually impossible to break up the smallest of these lumps by ordinary mixing methods. Aluminum bronze powder particles, like flour, tend to group together in clusters, having from 4 to 50 particles in a lump. By applying a high 31 in. vacuum to the paint, the air imprisoned within the lump is released with an explosive effect.

Tests are said to have proved that aluminum paint exploded by this vacuum process spreads more easily and keeps a uniform brilliance because there are no lumps present to roughen the surface.

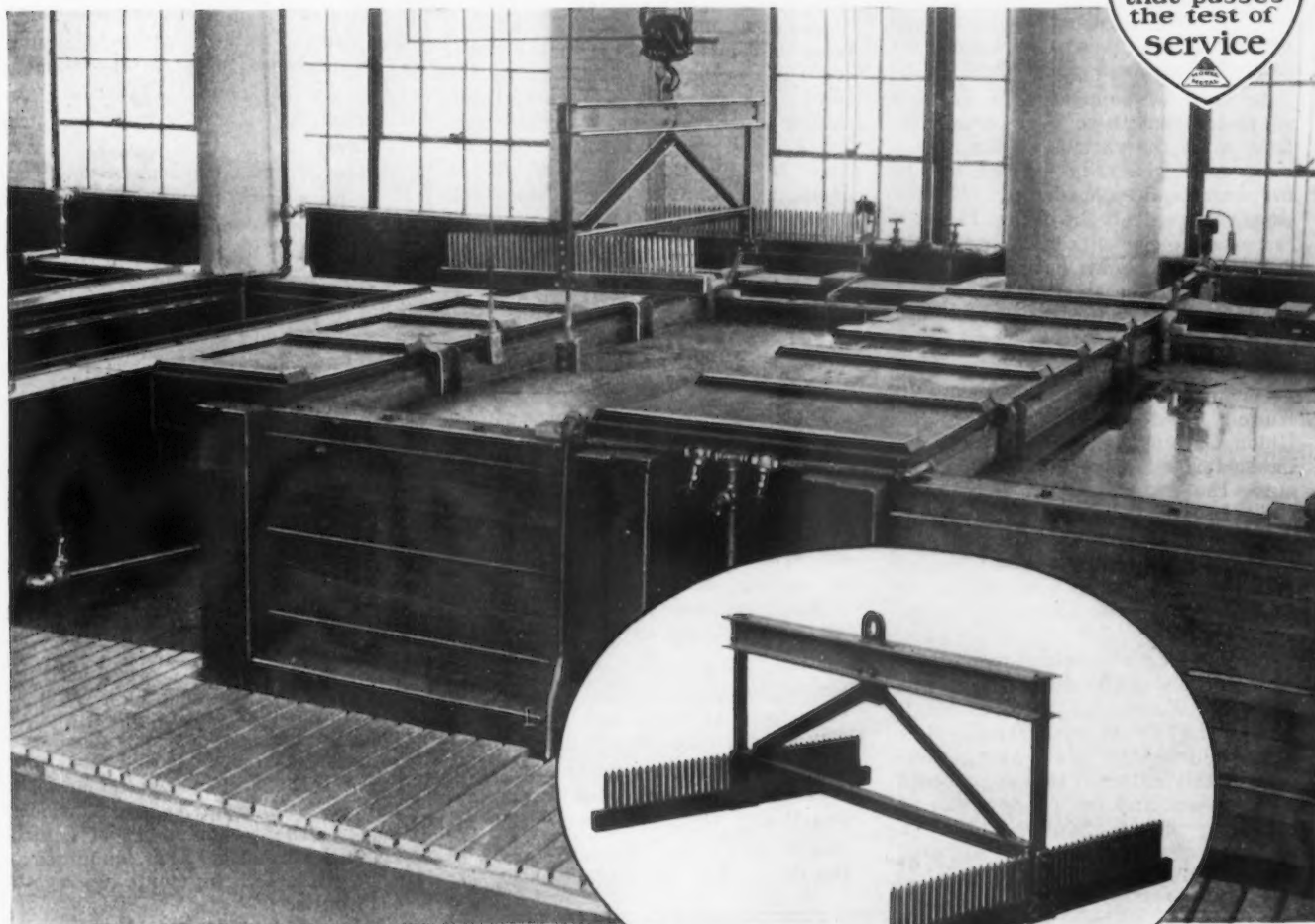
Northern Conveyor & Mfg. Co., 327 West State Street, Janesville, Wis., including property, machinery, buildings and accounts receivable, was offered for sale, for benefit of creditors, at public auction at office of the company on April 2, by George DeBruin, receiver.

MONEL METAL PICKLING RACKS

stand hard use in Bendix Baths

No. 65

Pickling
Equipment
that passes
the test of
service



● Pickling room at Bendix Products Corp., South Bend, Ind., showing type of rack used for pickling flat strip steel; also wooden acid tanks fastened with Monel Metal tie rods, nuts and washers. Inset shows interesting design of racks fabricated entirely from rolled Monel Metal bars including rounds, squares, flats and angles. Upper stiffening channels are formed from $\frac{1}{4}$ " Monel Metal plate; assembled entirely with Monel Metal rivets.

Sturdy, light-weight strip-holders fabricated entirely from rolled stock

Faced with the problem of pickling flat steel strips preliminary to cold rolling and forming operations, the Bendix Products Company turned to its own designing engineers... and Monel Metal... for a satisfactory answer.

The light-weight, yet strong, holders illustrated above show how

the job was handled using nothing but rolled Monel Metal stock parts: rounds, squares, angles, flats, sheets and rivets.

Monel Metal combines the strength of steel with high resistance to chemical reaction with either acid or alkali materials commonly used for pickling. Not being subject

to embrittlement by acid attack, it retains its full unit strength, even after many years of vigorous service.

Here's a challenge. Next time you have to replace a pickling crate, basket or rack, specify Monel Metal. Keep cases on that one item and compare its performance, its whole-life cost, and the quality of its work with equipment of *any other type*.

On such a basis we are content to have Monel Metal pickling equipment judged.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.



The Role of the Common Elements in the Alloy Steels

(Concluded from Page 26)

stress is lower if the tempering for a certain hardness may be accomplished at a relatively high temperature. It was suggested also that creep resistance may likewise be a manifestation of this same alloy effect.

By way of summary the speaker suggested that there were certain influences of the various elements that were quite generally exerted by all, for example, deep hardening. In such cases cost controls the choice. In other respects the elements make individual characteristic contributions to the properties of the steel. The requirements are then to be analyzed and the appropriate alloy steel meeting the demands is to be selected.

During the discussion, Dr. A. B. Kinzel, chief metallurgist of the Union Carbide and Carbon Research Laboratories, Long Island City, N. Y., made the assertion that the future trend in alloy metallurgy is the attainment of the highest strength with a minimum of alloy additions and of heat treatment, or by eliminating the heat treatment and balancing the alloy contents.

The meeting was held in one of the dining rooms of the club house of the American Society of Swedish Engineers at 27 West 51st Street, New York, a delightful place for gatherings of this nature. It was preceded by a dinner and the presentation of a moving picture, "The Metals of a Motor Car," obtained from the United States Bureau of Mines. It depicts

the operations involved in the building of automobiles at the plant of the Hupp Motor Car Corp., Detroit.

Nominations of officers of the chapter for 1934-1935 were announced by the nominating committee as follows: Chairman, J. S. Vanick, International Nickel Co.; vice-chairman, H. C. Bostwick, Westinghouse Electric & Mfg. Co.; secretary, T. N. Holden, 139 Charles Street, New York.

Dairy Equipment of Stainless Steel

(Concluded from Page 23)

tubes. This is said to be the first cooler either for milk or ice cream mix to be constructed without the use of solder and the first in which the design and construction permits the use of the bends as well as the tubes as cooling surfaces.

Manhole doors for tanks and pasturizers formerly were made of brass castings tin coated. Later the company fabricated the door from stainless steel bar stock and plate. The third and a quite recent development was to make the complete door from a single stainless steel stamping. Practically the only fabrication required is welding a socket joint to the door. The door frame also for-

merly made of a tinned brass casting is now fabricated from stainless steel sheets and plates.

Cylinders for ice cream freezers have been commonly made of plain steel and after these are machined a nickel silver liner is pressed into the shell. A few months ago the York company started to make these cylinders of stainless steel plate, which is rolled, welded, ground, rerolled and machined to get a true diameter and finally ground to remove tool marks. Agitators for tanks are made entirely of stainless steel, being fabricated from bar stock and sheets. The hubs are formed from bar stock, the blades from sheet metal which are welded to the hub and ground and polished.

German Diesel Exports Decline

EXPORTS of Diesel engines from Germany during 1933 registered a decline in value of 39 per cent compared with the preceding year, according to a report from Vice Consul J. H. Wright, Cologne, made public by the Commerce Department. A slight increase, however, the report shows occurred in the number of engines shipped during 1933.

Foreign sales of German Diesel engines in the calendar year 1933 were valued at 17,719,000 reichsmarks compared with 28,880,000 reichsmarks in 1932, a decline of 11,161,000 reichsmarks. The total number of engines shipped abroad in 1933 amounted to 4410, while 132 shipments aggregated 4215 units.

Under the classification "Diesel engines for water-craft," outstanding decreases occurred in 1933 in shipments to Russia, France, Spain, Belgium, Great Britain, the Netherlands and the United States. "Diesel engines for other than water-craft use" registered declines in shipments to Yugoslavia, Rumania, Switzerland, the Netherlands, Spain, Russia, Egypt, British India, Japan and the Philippine Islands. Inconsequential increases occurred in both categories, while an outstanding gain occurred in shipments to Italy.

Referring to the domestic market, the report shows that the German Diesel engine industry experienced a revival during the latter half of 1933. Demand was brisk throughout the winter months, usually a period of depression. Large individual contracts placed during recent months have to some degree compensated for export losses to principal markets, it is pointed out. The outlook for the industry during the current year is characterized as optimistic.

(Par value of Reichsmark equals 23.82 cents, U. S. currency)

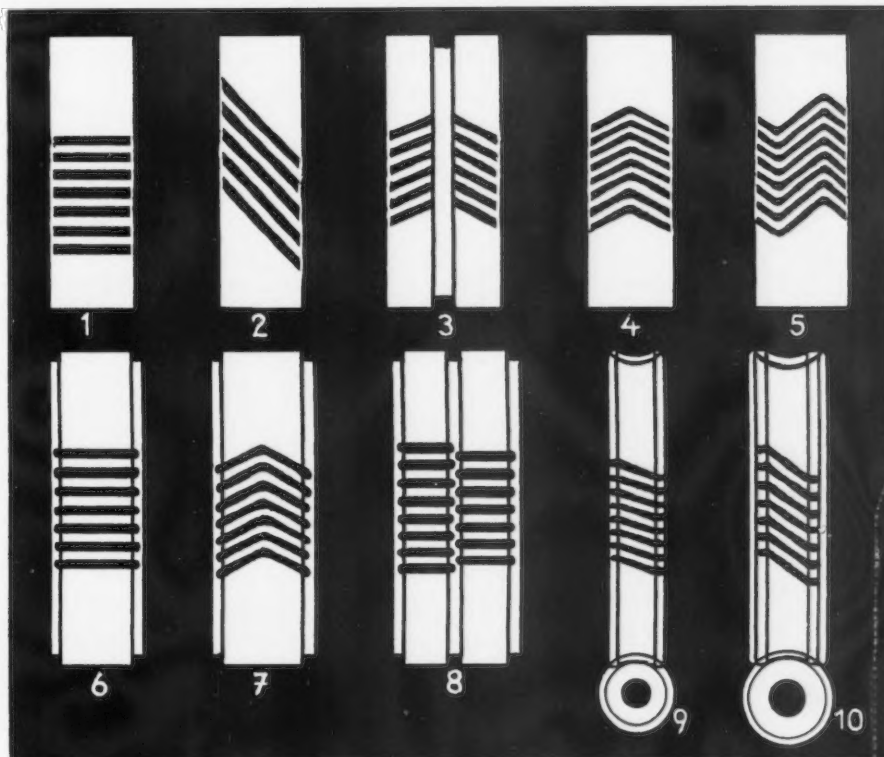
How good a job?
How long a life?

Satisfactory Perforated Metal is more than just metal with holes in it. The kind of metal, its thickness, design, size and number of holes must be correct to do the required job and have the longest possible life. Satisfactory Perforated Metal is an engineering product.

Wickwire Spencer Steel Company, 41 East 42nd Street, New York City; Buffalo, Chicago, Detroit, Philadelphia, Tulsa, Worcester; Pacific Coast Headquarters: San Francisco; Warehouses: Los Angeles, Portland, Seattle. Export Sales Department: New York City.

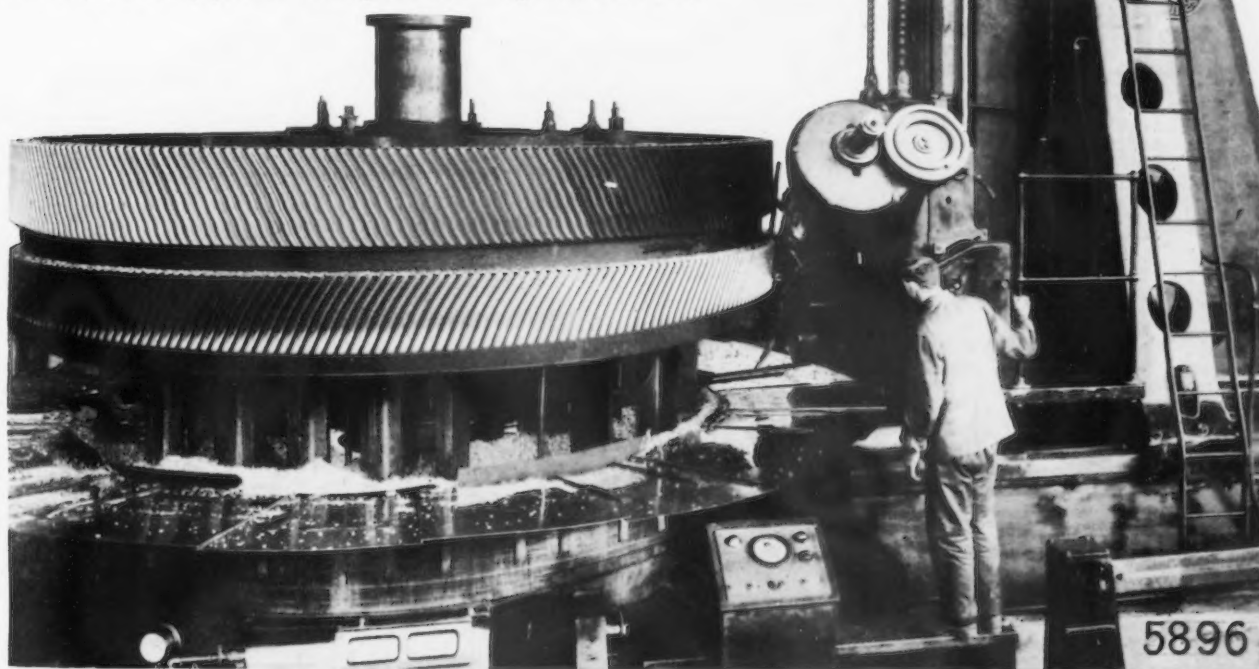
**WICKWIRE SPENCER
PERFORATED METALS**

ONLY ONE MACHINE for all kinds of gears



Precision Gear
Milling Machine
Model RF.

For the accurate and economical manufacture of straight and single helical toothed wheels (1 and 2), twin single helical wheels (3), double helical or herringbone-toothed wheels (4), compound herringbone-toothed wheels on either the generative or separate indexing principles with hob, single milling cutter or end mill (5), shrouded spur and herringbone-toothed wheels (6 and 7), twin spur wheels with staggered teeth (8), worm gears with transverse feed (9) and steep-pitched worm gears with tangential feed (10).



Schiess-Defries A-G. Düsseldorf

U. S. Representation: U. Kauermann, Fountain Sq. Bldg., Cincinnati, Ohio

JUST BETWEEN US TWO

Pipe Dream

AN anonymous reader clipped this item from page 58 of the Mar. 22 IA:

Natural Gas Service Corp., Jackson, Miss., will apply for Federal loan to construct 8209 miles of pipe for a gas line.

and sent it in with a note reading, "Prosperity at last—8,209 miles of pipe line! More power to your proofreaders." That's plenty of pipe, enough to reach from Mississippi to Cairo—Egypt, not Illinois.

Do they go over this family journal with a fine tooth comb!

The funniest typographical error we ever encountered occurred a few years ago. In manuscript a sentence in an article describing an open hearth furnace read, "At this point 50 tons of scrap is charged." The linotype operator left the "s" off scrap, but, Heaven be praised, the error was caught in the stone proof.

He Called the Turn

A SEVENTH son of a seventh son is John H. Van Deventer, Iron Age editor-in-chief, who forecast nine months ago the troubles Paragraph 7-A would unleash. See page 14 in July 6, 1933, IA:

"Organized labor . . . by fomenting discord through the exercise of selfish opportunism . . . may easily defeat the common cause."

No Embarrassment Caused Bouquet Tossers

WHO hasn't had the unpleasant experience, after passing along a kind word, of having his remarks and his name used without his permission in somebody's publicity? Of course, if the orchids you bestow are dun-colored blooms like, "I find your so-and-so not bad," or "could be worse," or "pretty fair," the risk you run is slight.

But if your enthusiasm calls for superlatives and you write, "I tried 'em all and find they're terrible compared with Glutz," you feel sort of embarrassed if Glutz smears it all over the landscape and you meet one of Glutz's competitors, who may be a pretty good egg. Besides he may be a director in the building and loan association you are hoping will take over the mortgage on the six-room-with-fireplace chateau.

So we play safe. When we receive a nice letter like this, we simply mention it as coming from one of the substantial manufacturers in the industry:

"We have been subscribers to The Iron Age for a number of years and it is one of the few publications we continued during the past several trying years, for we consider it indispensable."

Then we tuck it into our fat "bouquet" file, just in case any suspicious individual should ever want to be shown.

She Died of Improvements

THE wife of an immigrant who spoke English poorly became ill. He called at the hospital daily, and although not permitted to see his wife, was told, "She's improving." At the end of a week they told him she had died. Afterward, when anyone asked him what caused her death, he replied, "She died of improvements."

We always think of that story when we see the way doodads are tacked onto certain products. Perhaps the designer puts up a fight, but the sales manager says, "Of course, it doesn't mean anything. Maybe it does weaken the product, but it's a good selling point."

Publications have doodads. Usually the weaker the paper, the more the doodads. We try to steer clear of them, for our main job of scouring the field for information you can use and passing it along to you keeps us pretty busy.

More Time to Make Honey

BEES waste considerable time building the comb before they fill it with honey. To cut down the unproductive labor, we have it on the authority of the New Jersey Zinc Co. that a sheet of wax is now rolled out under a series of zinc die cast wheels, forming the hexagonal foundation for the comb.

To fool the bees the work must be done accurately, to the thousandth of an inch. Bee-made combs from Maine match combs from Lower California to within .001" per inch. Angles are exactly 60 deg., not plus or minus 1 deg., but 60 deg., no more no less, whether the bees are fat or skinny.

The fussy little brutes!

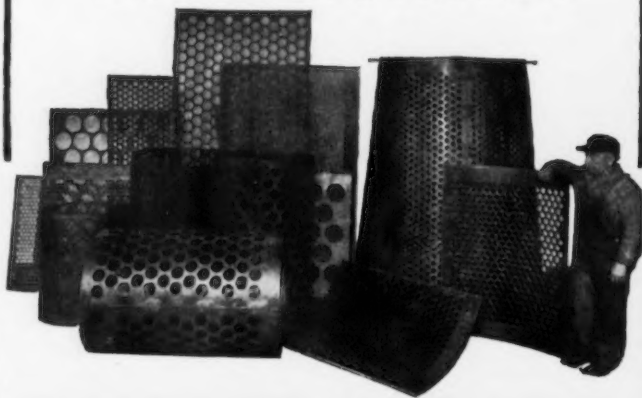
—A. H. D.

SCREENS of Perforated Metal

For a Thousand Uses

For Grain, Minerals, Chemicals or any other material to be screened
Ornamental Designs for Grilles, Cabinets, etc.

Any Metal—Any Perforation



The
Harrington & King
PERFORATING Co.

5657 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N.Y.

HENDRICK PERFORATED METALS

Perforated Metal Screens in steel, bronze, Stainless Steel, Monel, Aluminum, Everdur and other metals. Perforated Grilles in various metals and many special designs. Mitco Open Steel Flooring, Mitco Shur-Site Treads, Mitco Armogrids; also elevator buckets, conveyor troughs and products fabricated from heavy plate. Write for catalog.

HENDRICK MFG. CO.

37 Dundaff Street Carbondale, Pa.

Baltimore Birmingham Boston
Cincinnati Cleveland Detroit Hazleton
New York Philadelphia Pittsburgh

Cone 4-Spindle Automatics

Are economical and accurate producers of screw machine parts up to 6" diameter 7" milling length. They cut costs, increase production, boost profits.

Write for particulars

CONE AUTOMATIC MACHINE CO., Inc.
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Indiana: G. A. Richey, Chamber of Commerce Bldg., Indianapolis, Ind.
New York State: Syracuse Supply Co., Syracuse, N. Y., also Rochester, N. Y.
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California: C. F. Bulotti Machinery Co., 829-831 Folsom St., San Francisco, Calif.